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JOURNAL
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Vol. 23 No. 3 FRED C. ZAPFFE, Editor May, 1948

The Discovery of Medical Talent*

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The Association of American Medical Colleges has demonstrated in its recent history that it is genuinely concerned about the selection and education of medical students. During this period a medical aptitude testing program has been instituted and numerous studies have been made of various factors which seem to be important in the selection of students. No other profession has a record which approaches that of medicine in its concern over the careful screening of candidates for the medical profession.

In order to bring myself up-to-date on the educational and personnel research which has been done in medical education, I have made an extensive survey of the literature in the field. As a result of this survey, it appears that certain questions have been fairly well answered, a certain number have been partially answered and a good many others have not been touched upon. It would seem fruitful to discuss briefly the present state of our knowledge about some of these problems and in certain instances to suggest types of research studies which may be instituted to obtain the answers to important questions.

REVIEW OF THE LITERATURE

UNDERGRADUATE RECORD.—The quality and quantity of performance in undergraduate work as indices of probable success in medicine have received considerable attention in the literature. It is quite generally agreed that students who do well in undergraduate work do well in medical school. There is also some evidence that performance in science courses is a little more closely related to success in medicine than is the general grade point average.[5] But at this point our feeling of sureness ends. For example, such statistical evidence as we have shows little relationship between amount of undergraduate credit hours and success in medical school or between the pattern of undergraduate studies and success in medical studies.[2,4] The requirement of a bachelor's degree or of a certain number of hours of science must be justified on grounds other than the relationship between the undergraduate record of courses taken and

*Read at the Fifty-eighth Annual Meeting of the Association of American Medical Colleges, held in Sun Valley, Idaho, October 27-29, 1947.

success in medical school. As far as statistical data go, one could argue just as well that a minimum science program with a maximum of emphasis on social and cultural studies would make just as good if not a better preparatory course for medicine than the emphasis upon science which is found in many medical preparatory curricula. This is not to say that certain specific science courses should not be required of all medical students; that may be the case but the arguments can not be based upon what we know about the selection problem.

TESTS OF INTELLECTUAL CALIBER.—The research pertaining to intellectual tests (the medical Aptitude Test by F. A. Moss and other similar tests) may be summarized by saying that medical schools are fairly successful in selecting students with the requisite general mental ability to master the work required in the medical school curriculum. Some refinements may be possible by studying more intensively the relationship between certain aspects of mental life and success in medical school. We have for example, considerable evidence to show that there are such functional unities in mental life as memory, verbal ability, number ability, reasoning, spatial relations thinking and perceptual speed. While studies using such tests as Thurstone's primary mental ability tests have not proven highly successful, it is possible that there may be sub-factors within these functional unities, variations in which may be associated with achievement in the study of medicine. It would not seem, therefore, that the further study of intellectual factors should be completely abandoned. While refinements in present day scholastic aptitude tests may not add much to our efficiency of prediction it is still possible that something important may be discovered by a more intensive study of the major attributes of intellectual behavior. It is also possible that important linkages may be found between so called intellectual factors on the one hand and personality and interest factors on the other.

PERSONAL HISTORY DATA.—Comprehensive studies of the relationship between various personal history data items and success in medical school have been made over a period of years by Zapffe. These items include age, sex, amount of formal education, type of degree earned, type of undergraduate college attended and similar items. In one such study[6] for example, it was found that students with 3 years of liberal arts work did better than those with degrees, that students coming from the medical school's own undergraduate college did better than those coming from other institutions, that students coming from approved colleges did better than those coming from non-approved colleges and that men did better than women.

These data together with those from related fields, suggest that personal history data items, if systematically evaluated, could be of value in the selection of medical students. The Life Insurance Sales Research Bureau has, for example, prepared a personal history data blank consisting of ten items which are scored by a set of differential scoring weights based upon the demonstrated value of each item in predicting success in the selling of life insurance. A total score is obtained for the blank as a whole which can then be used in the selection process. Used in conjunction with undergraduate transcripts, test scores

and interview data it is conceivable that a data blank similar to that used in the selection of life insurance sales personnel could be developed for the Association.

APPRAISALS OF INTEREST AND PERSONALITY.—Until recently, tests in this category were rarely used in the selection of medical students. Even now they are being used pretty much on an experimental basis. Jacobsen[3] has reported favorable results with the Strong Inventory, scoring the student's responses for science interest. He also found the Minnesota Personality Schedule to be helpful. Douglass[1] at the University of Minnesota reported very little success with the Strong Blank scoring the blank with the physician key. Most investigators report only slightly favorable results with present day types of pencil and paper personality inventories.

Very recently such projective test techniques as the Rorschach and Thematic Apperception Test have come into favor as experimental selection techniques. It is too early to say what the results will eventually be. At the present moment it does not appear that these devices, at least in their present form, will turn out to be revolutionary in their effectiveness. The important thing is, however, that these techniques will probably give us a more thorough understanding of human personality and may suggest new approaches to the measurement of personality traits which will prove effective in our selection procedures. It is also possible that these techniques may help us in the development of better criterion measures and may suggest modifications in our personnel practices in medical colleges.

EVALUATION

The research which has been completed to date may be evaluated as follows:

1. The undergraduate grade-point average is one of the best indicators of probable success in medicine, especially in the case of students who come from the medical college's own university undergraduate college. The sheer number of hours of credit and the pattern of subjects studied do not seem to be closely associated with success in the study of medicine.

2. Aptitude tests like that prepared by Moss and tests of general scholastic ability, e. g. the American Council on Education Psychological Examination, Ohio Psychological Examination and others, correlate with success in medicine to about the same or a smaller degree than does the undergraduate grade point average depending upon the particular medical college in which the tests are used. These tests seem to be especially useful in the selection of students coming from colleges which are not particularly well known to the medical school. Tests of academic achievement such as the Cooperative General Culture Test and the profile tests of the Graduate Record Examination have been administered by a few institutions but no comprehensive reports on their value have been reported in the literature. Results on the Professional Aptitude Test and the Premedical Science Achievement Test of the Graduate Record Office will, of course, be available shortly. At the present moment it should be emphasized that use of these tests is still in the experimental stage.

3. Personal history data are used by many medical colleges in the selection

of their students. Evidence of this is the fact that applicants are always required to fill out a fairly complete application blank. Information is lacking, however, as to just how these data are used and how effective they are in the selection process. It is hoped that some light can be thrown on this problem by studies to be sponsored by the Committee on Personnel Practices and conducted by the Office of the Director of Studies in cooperation with the Office of the Secretary.

4. Tests of interests, personality and attitudes offer some promise of being useful in the selection of medical students but work in this field is still largely in the experimental stage. A number of schools have excellent research programs underway which will result in a better evaluation of these instruments. Seven colleges are cooperating with the Office of Director of Studies in a study of the Jurgensen Classification Inventory. This instrument is designed to measure personality factors by an indirect procedure and has been found to be effective in the selection of graduate students in chemistry and in certain industrial situations. Admittedly, research on the inventory is at present very limited and only further study can tell us what its probable future value will be.

5. The selection interview, and in some cases the psychiatric interview, have been used in the process of evaluating the qualifications of applicants for admission to medical college. Unfortunately, there are few if any data in the literature which indicate that a thorough analysis of this technique has been made. During the war the military services used the interview extensively in the selection process and when conducted systematically, found it to be useful. Similar studies of the usefulness of the interview in the selection of medical students might well be undertaken.

NEEDED RESEARCH

The studies which have been completed by the Association, individual colleges of medicine, individual educators and psychologists and personnel research agencies have been very helpful in improving the methods of selecting medical students. The reports of Zapffe indicate clearly that the quality of medical students has risen steadily during the past fifteen years. Without the research data provided by these studies, improvement in selection techniques would have been difficult if not impossible.

And yet, while noting the contributions which these studies have made one must also be aware of their shortcomings. Perhaps the chief criticism which one is prompted to make is that the studies completed to date provide partial but not conclusive answers to the many questions arising in the selection of students. Witness, for example, the conflicting reports coming from different schools. This can only mean that while some of the variables have been studied they have not all been investigated. What we need now are coordinated research efforts in a number of different medical colleges so that a common attack can be made on these problems.

It is also evident that we have been preoccupied (at least in our research) with the selection of medical students on a basis which is largely intellectual.

The personal qualities of applicants, their adjustment and their motivation to enter medicine have received less careful study than they deserve. To be sure, it is important that research be done on the relationship between intellectual factors and success in the study of medicine. There is no question but what a certain minimum level of mental ability is required for the study of medicine and compared with many other lines of vocational activity that minimum is quite high. There is no question either but what medicine needs a substantial number of the finest intellects obtainable, especially in its research and developmental staffs. But the search for the most efficient methods of finding the individuals with the proper intellectual qualifications should not distract us from the search for measures of those personal factors which play an important role in the success of the medical doctor. Admittedly, research in this area is difficult and often disappointing, but if we are to improve our predictions of success in medicine to any marked degree, research studies in this area must be undertaken. With present available selection techniques it should be possible for most medical colleges to fill their freshman classes with individuals who have the requisite mental abilities. Whether they will have the "right" personal qualifications is a more difficult question to answer because of the lack of precise techniques for the measurement of those qualities.

In the studies which are reported in the literature the criterion of success in medicine has, without exception, been grades in medical school. As far as the writer knows, studies of the adequacy and reliability of grades in medical school have not been published in the literature. This is unfortunate. Investigations in some other professional schools, undergraduate colleges and graduate colleges suggest that school grades as criterion measures may fall considerably short of desired standards. Similar findings are reported in the literature of industrial psychology.

There are at least three questions which should be raised about the criterion used in the evaluation of success in medical college. First, are the grades or marks reliable, that is, are they consistent? Do different instructors agree on the rank-order of students in a given course? How do marks in one course agree with those in other courses? Studies of grades in other types of colleges suggest that these are extremely important questions to raise. We need answers for these questions as they pertain to medical colleges.

A second question pertains to the discriminating capacity of the marks given in medical school, that is, is there a good distribution of grades (A, B, C, D and E) or are nearly all students put in one or two categories? In one study made recently it was found that 70 to 95 per cent of the students received A's and B's. With such lack of discrimination in the criterion measure it is almost impossible to find predictor variables which will correlate with success in medicine as presently measured. Other means should be found to provide a sharper discrimination between the performance of different students.

A third question pertains to the comprehensiveness of the criterion presently used. Are marks in medical school based upon the all around performances of the student or are they restricted to intellectual performance alone? If all-

around performance is being measured, do the different instructors use the same basis of comparison in making their judgments? It has been said by many that success in medicine is dependent on personal as well as intellectual qualities. Is adequate recognition being given to this fact in evaluating the success of students in medical college?

The criterion is a matter of serious concern not only in personnel research but to the whole program of medical education. It is not difficult to see that the nature of the criterion is fundamental to the whole selection and undergraduate training problem. It is our hope, therefore, that more time and thought will be given in the years immediately ahead to studies of the criterion problem. Without such research we will be unable to answer questions about the adequacy of present methods of evaluation.

In summary, the two areas in which research appears to be most needed are in (1) the study of the non-intellectual correlates of success in medicine and (2) the improvement of the criterion which we use to measure the performance of medical students. It might be added that these problems are not entirely peculiar to the selection of medical students. They plagued those of us who were engaged in personnel research in the military services and they are prominent in the thinking of industrial and personnel psychologists who are concerned with selection, classification and guidance problems. It is highly likely that any knowledge which is acquired in one area will have a transfer value to other areas. By working on these problems on a cooperative basis, it is likely that important progress may be made.

The two areas of research described in the preceding paragraphs point up the importance of a problem which has found frequent mention in the Journal of this Association, namely what really constitutes a good doctor. What sort of a person is he? Is he a man who should be primarily interested in helping people or should he be a scientist who is primarily interested in the human being as a biological organism—an object of impersonal scientific study? What are the differential characteristics of successful and unsuccessful physicians? Until we have answers to such fundamental questions it will be difficult to provide information about the most appropriate undergraduate training program for prospective medical students or about the standards which should be observed in the selection of students for our medical colleges. In so far as possible, therefore, our research should be directed toward the answering of these very fundamental, though perplexing, questions.

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Selection of Medical Students*

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If we could have a firm agreement on the aims and objectives of medical education, we would go a long way toward solving our problem of the selection of medical students. It is impossible intelligently to select students or anything else unless there is a clear knowledge of the purpose for which the criteria for choosing are established. We are all indebted to President Tresidder for his lucid statement and excellent formulation of the "Aims and Objectives of Medical Education" (J. A. A. M. Colls., 23:10 (Jan.), 1948) and to such studies as that by Dr. Raymond Allen in his Commonwealth Fund monograph on "Medical Education and the Changing Order," where an attempt is made to define the purpose and the responsibility of medical training. Actually, we can do fairly well in predicting success in medical school and can even have reasonable assurance of how a man is going to perform in his internship, residency, and other house officer duties, but as yet we cannot be at all sure of what he will do in the ten or twenty years after he has finished his period of formal training. The latter is the very time for which we need most to be able to select wisely, because it is in this time that the physician is going to take his place in our social structure. It is on his performance during this time that society will pass judgment on the adequacy of our system of medical education to train men to meet the health needs of the American people and to assume the socially responsible role that many great medical leaders of the past have held.

On the basis of figures supplied by Dr. Fred C. Zapffe from the records of the Association of American Medical Colleges and by Dr. Donald G. Anderson of the Council on Medical Education and Hospitals of the American Medical Association, we can examine the adequacy of our present selection methods as judged by the performance of students in school. There were 6,073 freshmen admitted in the fall of 1946 in approved medical schools of this country. Reports from all but three schools at the end of the year indicate that 200 students have not been heard from, 430 were dismissed for poor scholarship, and 233 dropped out of school for stated reasons of health, finance, or some other factor. Many of these latter students were probably imminent failures. A much greater number of students were conditioned or placed on probation because of doubt as to the quality of their work. Thus, we had an actual loss of a little over 11 per cent in last year's freshman class, with a minimum of 7 per cent having been dropped for academic reasons—despite the greatest number of applicants ever to seek medical careers. Presumably, the selection of superior students should have been easier than ever. If we consider all four

*Read at the Fifty-eighth Annual Meeting of the Association of American Medical Colleges, held in Sun Valley, Idaho, October 27-30, 1947.

medical classes during the last academic year, we find that in only four schools were there no students dropped for academic reasons and that a total of 672 were denied further registration in medical school. Interestingly enough, there were some 570 students in our various medical schools last year who had previously failed and subsequently been re-admitted and were repeating medical work in their original or some other medical school. If, however, we take the number of students who successfully completed the senior year in 1947, we find that of the 6,648 students who started as freshmen in 1944 only 5,688 students completed the senior year—a loss of nearly a thousand students or a mortality of approximately 15 per cent on the basis of inability to meet the academic requirements of our medical faculties. If we could so select our students as to eliminate at the start this 15 per cent who are apparently intellectually or emotionally unable to make the grade, we could increase the output of trained physicians from our schools by this quantity without the necessity of starting any new schools or spending any more money than we now do for medical education. Thus we would not have to increase the difficulty of securing adequate teachers and the present competitive bidding between schools for any kind of teachers at all. At the same time we would raise the standards of medical education by having a better group of students to work with—if we could only solve this problem of selection. While it is relatively easy to test for mental capacity or to make judgments as to personality, it is extremely difficult to make the more important evaluation of character and to assess the motivation of those seeking admission to medical school.

There are a number of ways of trying to get adequate predictors of performance in medical school. We need to make judgments on ability, in order that we may keep high intellectual standards; on achievement, in order that we may gear the level of our instruction on an advanced plane; on motivation, in order that we may understand the kind of human being we are dealing with; and on character, in order that we may secure the degree of personal integrity and social responsibility that will enable our product to be one of which we can be proud. In all honesty, most of us would have to admit that we still have grave doubts about some of the people that we now graduate from our medical schools and turn loose on the public with our official stamp of approval. Despite the advantages to the schools of the increasing number and quality of applicants, we must all bear in mind, especially at this time, the undesirable features inherent in the great competitive stress in gaining admission to medical school and in remaining in it. What this constant high degree of competitive strain does to the individuals who seek a career in the field of medicine is difficult to assess. Many schools are at the present time carrying on extensive studies on methods of improving our ability to choose wisely our potential future physicians. In the various selection techniques it is extremely important that we do not set a rigid pattern, but that we allow for breadth and variety, partly through minimizing specific premedical requirements and also through considering the aims of medical education in the various schools and the kind of teaching and training that each school can do best. Since students enter medical training at

various stages or levels in their development, it is important that selection procedures not be restricted to any small class of individuals or to any limited age group. Certainly it cannot be said that any one pattern of premedical training is the only way to prepare for this type of career, and medicine will be the better for taking people with varied backgrounds into its fold. We must not close the door on the gifted non-conformist who may have great contributions to make in this field.

At the University of Chicago, for the last several years, we have had an orientation period for our entering freshmen medical students. We ask them to come a week earlier than the start of the school year for the rest of the classes. During this time we try to explain our own school to them and we ask competent outside speakers to come in and tell them about trends in medical education the country over and to give them a perspective against which to evaluate their own medical schooling. We also ask several social scientists to give them an authoritative picture of the costs and distribution of medical care. We do this without special reference to existing or proposed legislation along these lines. We seek merely to give the students an adequate factual background so that they may make up their minds intelligently about the answers to some of the controversial issues which are being raised in this area. Also we have subjected the students during this time and later to a large series of tests and interviews in an attempt to find something of predictive value that may in some future time be given to some or all of our medical school applicants and which will prove helpful in the selection and later guidance of our students. Miss Mary Jacques and Miss Anna Elonen, working with Dr. Henry Brosin since his return to Chicago two years ago as professor of psychiatry, have been most active in our testing program, which is a continuation and extension of a testing study on our medical students previously started with the co-operation of Benjamin S. Bloom of our University Examiner's Office. At present we are mainly interested in the possible value of the "projective techniques" such as the Rorschach and Murray's Thematic Apperception Tests. We also use tests of ability, despite the fact that "intelligence tests" have not been able to give us all the answers some people formerly expected of them. We also try to determine attitudes by such devices as the Strong Interest Test, the Allport-Vernon Study of Values, and by individual psychiatric interviews later. We have used the Primary Mental Abilities Test, an Interest Schedule, a Temperament Scale, and a Classification Inventory, the latter at the request of Dr. Carlyle Jacobsen.

We are not only studying these established tests but are interested in the various types of interview techniques. We need to be able to evaluate these techniques and get cross checks on the different interview methods for trying to select people in various situations for particular purposes. At present we cannot say much about the predictive value of any of our attempts, but we hope in five years to be able to have a better means than now exists of evaluating such things as motivation and originality. A co-operative parallel study is being carried on

at the University of Illinois College of Medicine by Dr. William Earley. In view of the fact that one of the main purposes of the University of Illinois College of Medicine is to train clinicians, while the avowed chief aim for the establishment of the University of Chicago Medical School was to contribute to the advancement of medical sciences and was not primarily to increase the number of practitioners, it will be interesting to see the comparative value of these various tests applied to the population of a state tax supported school as contrasted with that of a privately endowed school. We believe the most important of our selective devices must depend upon reliable predictions of personality, not in the isolated sense, but in the sense of the individual in the total of his relations and functioning in society. It is essential that the various selection methods of different schools be carefully studied, and we cannot as yet put complete or even chief reliance in either tests, interviews, grade averages, or letters of recommendation. In different situations the relative value of each of these will vary, and we must explore all the possibilities and take full advantage of the contribution of each if we are to improve our selection procedures.

There seems to be a lack of real understanding as to the ends (and methods of achieving them) existing between many medical educators and the premedical advisers and teachers who play so important a role in the lives of our potential medical students. While some few medical schools have done much along this line by effective and regular visits to the premedical schools supplying most of their students, the almost unanimous complaint of the men in several large premedical conferences was that we have not told them what kind of premedical education we really want our prospective students to have nor what criteria we actually use in selecting those students who will be allowed to go through medical school. Talk about the failure to communicate ideas!—there is no better example of this than the usual statement of admission requirements and procedures as given in our medical school catalogues and announcements. Alert students who wade through very many of these must consider us liars or dullards, or both. As long as we are not clear ourselves in exactly what we are trying to do, it cannot be expected that we could make our position any less confusing to our future students.

It is amusing but on the whole disillusioning and saddening actually to go through all the materials on admissions in the latest catalogues from each of our medical schools. In only half a dozen instances is there some fairly adequate statement of the actual selection policy used (rather than a vague but high-sounding preachment about the fine qualities we are looking for in our would-be physicians along with an unstimulating list of courses which must be taken). However, it must be remembered that selection procedures vary at different schools and that it is often difficult if not impossible to give in a few words any exact statement of procedure or policy. The admissions committee has the responsibility of selecting worthwhile applicants, and its specific criteria often cannot be enumerated completely. We should take in good faith the judgment of the admissions committee, but the group must be composed of the kind

of men on whom we can rely and who justify our respect. We must maintain the right and the duty of the admissions committee to set up its own standards and then to select the best qualified applicants according to its views. It is to be hoped, however, in so far as it is possible to put into clear wording, that an honest statement of policy will be given to the public. In less than a dozen catalogues is there anything resembling a really convincing statement about the desirability of a broad general education or of the necessity of a sense of social or moral responsibility in those who would become physicians. Even when lip service is paid to the necessity for a knowledge of our cultural heritage and an understanding of the relationships of men to their fellows, there is the constant complaint of premedical advisers that we do not really mean it and that we often sell them short in the actual selective process by putting undue weight on advanced and highly technical courses in the fields of science. The real difficulty is largely a matter of attitude. If we really mean it, we can with a clear conscience say to our applicants that a student, whether he is going into medicine or any other advanced field of knowledge, must have a good foundation in general education including considerable work in the various fields of knowledge such as the social sciences, humanities, physical sciences, and biological sciences. All these areas contribute to the liberal education desirable in all citizens—and a doctor is first of all a responsible citizen in his community. A medical student must of course have the adequate scientific background and training in a minimum of specific concepts and tools with which a modern physician must work. His motivation will determine to a large extent how the student will use the desired qualities of intelligence, honesty, intellectual curiosity, imagination, co-operativeness, and a willingness to work long, hard hours necessary for a successful career in medical school. The most desirable candidate is the one who will put his medical education to some useful social purpose, whether that be for the advancement of medical knowledge or the extension of medical care.

One very important limitation in our selection of students has been the failure of medical schools to come out with a clear statement of the belief that professional education must be based on sound intellectual grounds that are of value in themselves and which make worthwhile and necessary contributions to our social well-being. There are many highly desirable boys that we would all be proud to welcome into the medical field who since the war have turned away from a previous intention to go to medical school and who are now seeking for significant answers to important questions by study in the arts and social sciences. Despite the fact that many of them will doubtless be disillusioned elsewhere, we cannot escape the responsibility for not attracting more of these superior people into medicine. Most of us probably would admit that even with all the increased applications we are getting, it is still hard to fill our classes with really good candidates.

There are some four factors contributing to the present low esteem in which the medical profession is held by some segments of the public, among whom we must count desirable potential medical students. One of these is the feeling,

brought about in part by much recent newspaper publicity, that medical men are as a group extreme reactionaries who are bent on preventing progress in the methods of paying for and extension of the distribution of medical care to the many people who feel a need for adequate health protection. As Dr. Raymond Allen points out, medical education shares "in the responsibility for the failure of the medical profession to exhibit social insight and aggressive leadership in molding public opinion toward a comprehensive handling of the problem of adequate medical care for all the people. It is the responsibility of the school and university systems to so educate physicians that they will be as proficient in meeting and solving the social and economic problems of medical service as they are in handling the professional and technical problems of the practice of medicine."

A second factor is brought about by the impact of the advancements of science on clinical medicine and the improvement in our understanding of causative relationships in many diseases. This has led to an exaggerated interest in "cases" and a neglect of the sick individual as a person. This question was well presented by Dr. Alan Gregg in his article on the "Transition in Medical Education" which was published in the July, 1947, issue of our own *Journal of the Association of American Medical Colleges*. One important contributing factor to this belief that the modern medical man is more interested in disease than in human beings who have the disease is the great reluctance with which many physicians accept responsibility for making night calls. While it is true that the disease will still be present the next morning, the specific patient may not be, and a humane interest in relieving suffering should be just as active at night as in the daytime.

A third factor is the fairly widespread feeling that medical men are all constantly grasping for money. This preoccupation with materialistic self interest is best evidenced by the occasional unwarranted excessively high fees charged by some unthinking or unfeeling specialists—and, unfortunately, that is the thing that gets gossiped about among lay people, rather than the instances of financial self sacrifice occurring often in the lives of many physicians.

The fourth is one of the most valid of the factors that have led to criticism of the field of medicine. While medical education is at least indirectly responsible for the previous conditions, we are directly responsible for this fourth one—which is the charge that we are no longer turning out men who are capable of filling the greatly respected role of the physician of the past who was genuinely interested in all his patients, but rather that we are now doing little more than training a group of super-technicians who deserve no higher a place in our esteem than any other equally skilled laborer. We must not let empiricism, rather than thought, dictate the basis of our medical education and research. The more we emphasize the purely technical aspects of medical training, the more vocational we must of necessity become and the further we get away from the intellectual content and the proper emphasis on the social responsibility of medical practice, which is after all the primary concern of the medical school rather than of the medical profession as such. We must teach the students to

think critically about all the problems touched by medicine, as well as train them in the proper applications of the advances of the basic sciences to the treatment and prevention of disease. The student must become well acquainted with the art of medicine and not be too reliant on laboratory tests and hospital facilities, in treating the sick and the near sick.

This presents a difficult dilemma to our educational system in this scientific age, and it cannot be solved by mere juggling of the premedical or medical curriculum, but can only be met by a true change in attitude toward the aims of medical education. We must solve all these problems that are most certainly turning some very good men away from medicine. We in medical education must realize fully the extent that responsibility is commensurate with knowledge—this puts the challenge right up to the physicians, who have greater knowledge of man in health and disease than any other section of society—and so select our applicants that they will justify the great knowledge and power we can give them.

There are two other restrictions which limit the free selection of potential medical talent and thus hinder our efforts to get the best qualified material. Part of the price we have to pay for the present high quality of medical training is the necessity of covering a portion of the expenses from student tuition and the consequent narrowing of the field essentially to the financially secure group. The other limitation is dictated by the prejudices of our admission committees which often set up barriers through discrimination in matters of race, religion, and sex. The experience during the war and the educational benefits made available to veterans since the war have given ample proof that there are many worthy boys who previously had not considered a medical careeer because of the financial limitations, but who are well qualified in all respects for medical work. While it is true that we all know of some exceptional individuals who spend many hours in self-support and yet make creditable records in college and medical school, nevertheless, it is undoubtedly true also that there are many potentially desirable students who are never admitted to medical school because their college grades are too low due to the necessity of earning a living while going through school or because of their inability to contribute financially to their own medical education. Plans for financial aid for worthy students must include provision for premedical as well as medical training. The selection of applicants for such help should be purely on the basis of promise and ability. As far as the limitations because of race, religion, or sex are concerned, in general the present practice in selection often actually renders a disservice to the public through limiting our field of choice, aside from the moral issues involved. Race or religion are not valid grounds on which to base selection procedures, and if we are to attract the best possible candidates into the field of medicine and are to serve the best interests of all the public we must eliminate such factors in the consideration of admission to medical school. We must make an honest appraisal and prevent injustice being done to individual applicants merely because they happen to belong to a particular group.

Finally, we must remember that these are not isolated problems with which we are dealing, and that there is an extensive interrelationship among the difficulties of the selection of students, the financing of their education, the kind of curriculum we provide them with, and lastly the type of graduate training available. While much may be done through proper selection, there is still a great deal that can be accomplished by the medical school and the training hospital in molding the future physician in the desired manner. This responsibility cannot be shirked even with improvement in methods of choosing those who will be allowed to go through medical school. The attitude present in the school and training hospital probably will have a greater influence on the development of ideals, character, and ethical standards of the student than any other single factor.

In conclusion, it seems clear that we must work out adequate selection methods so that we will get the kind of men into medicine who cannot rightly later be characterized as reactionary, avaricious, materialistic super-technicians who are interested only in "cases." We must choose the right kind of man and then help him attain a significant niche in society. This achievement will be brought about by his becoming a good citizen, his being equipped with the tools of his trade, his possessing the scientific spirit of research along with a strong social consciousness, and his having a high sense of moral responsibility and personal integrity.

The Personal Interview in the Selection of Medical Students*

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It has been said we are losing the art of judging character as we place more reliance on objective tests and measurements. Success in life a few short years ago was dependent on an individual's ability to quickly "size up" a stranger. Our pioneer forefathers' daily existence depended to a large extent on this faculty. The Pony Express riders were chosen in a twenty minute interview. Napoleon chose the generals of his armies after a thirty minute conference. This procedure is in contrast with the selection of members of the O. S. S. where a variety of psychologic tests were used in screening this personnel. These data have been brought together by Harry A. Murray in his book, "The Assessment of Man." The author makes this statement:[1] "A personal interview was the most important test of our thirty-odd testing procedures, but there are no definite figures which confirm this impression. The value of the interview depends on the interviewer's talents and experience. Even the best interviewers, however, make numerous predictive errors. Multiple interviews are the most reliable guide in the selection of personnel." In his article, "Military Psychology in War and Peace," Walter V. Bingham states,[2] ". . . the factors which tend to differentiate the best officers from the very good are not measured with precision by means of tests of educational achievement or scholastic aptitude." Waggoner and Zeigler[3] tested freshman medical students at the University of Michigan with a large battery of tests and concluded "that a proper correlation of the psychologic tests with the Rorschach and the final correlation of these with the psychiatric interview enabled us to make a fairly accurate prognosis of the individual's ability to succeed in medical school work."

The medical school applicant must possess many attributes: honesty, intelligence, memory, perseverance, accuracy, intellectual curiosity, charity, faith, humility, hope, patience, emotional stability, and a flair for hard work.[4] He should have a well developed social conscience. He should be a good citizen. He should be well read. He should be able to speak clearly and well. He should be a rapid, sound reader. Only a few of these qualities lend themselves to objective measurement. It is with the others that the personal interview should deal.

The personal interview as a selection device should not be used to determine attributes and attitudes which can be measured objectively. Its use should be reserved for the evaluation of personality factors. It can be used effectively to select the applicant who inspires confidence, the one who has a personality defect, the potential troublemaker, the emotionally unstable, those with a capacity

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for leadership, those with breeding and poise, etc. The purpose of the personal interview is to provide the applicant with an opportunity to display his qualifications. To do this to the best of his ability is his problem; to assist him in supplying the necessary evidence and for successfully conducting the interview is the responsibility of the interviewer. The personal interview should not be used to put the applicant "on the spot," rather it should give him every opportunity to present himself favorably.

The majority of poor personal interviews follow three patterns: (1) Those in which the interviewer does all the talking; (2) Those that follow a set form of questions, and (3) Those that are conducted without plan. As suggested and outlined by Samuel H. Ordway,[6] these errors may be obviated by "the planned conversational approach." The applicant is encouraged to talk about his experiences and background. The subject he pursues is not important; the object is to keep him talking. The interviewer is ready with encouragement but is content to await the evidence as it occurs.

The interviewer must be alert to direct this talk into the channels of the general plan of the interview. The interviewer wants answers to his questions supported by evidence; he must assume command of the interview and at the same time keep his questions and talking at a minimum. He should be content to wait for his evidence; he should be a "good listener." Some find it desirable to employ a check list,[7] and as the various areas are touched upon, check off the evidence as it occurs. Most applicants experience tension at the beginning of an interview. The applicant is desirous of creating a good impression, of saying the right thing; the responsibility for relieving this tension rests with the interviewer. To fail in this, results in an unsuccessful interview. The applicant must be made to feel he has been given every opportunity to display all his qualifications. He should feel the interview has been thorough, fair, and just; he should leave with a "good taste in his mouth."

The question of whether an applicant should be interviewed by one interviewer at a time or whether he should be interviewed by a group of interviewers at one time is often raised. The group method of interview is not frequently used because of deference to the applicant's increased tension and his unwillingness to talk before a group; however, the efficiency of the interviewers is markedly increased with the group method of interview provided they are skilled in putting the applicant at ease and getting him to talk.[8] The applicant also is spared much needless repetition in the "warming up" process and he feels that a group interview is more fair because a single interviewer rarely over-steps the grounds of propriety in the presence of other members of the interviewing team, and because personality differences and clashes are reduced with a group of interviewers. With this method there are a variety of personalities to whom he may respond. It saves the applicant much time. If we agree that the personal interview is a tool for gathering evidence of personality and character, a group of three interviewers, each with a specific assignment, can gather more evidence and pursue more clues than a single interviewer in a given period of time. Thereby the overall efficiency of the group is increased. They have an opportunity to

assist each other in drawing out evidence. They have the opportunity immediately following the interview to compare notes, to quote, weigh, and evaluate evidence in support of contentions; and perhaps most important, as a group, they can come to a final conclusion in regard to the applicant's qualifications while the evidence is fresh at hand. A practiced team of interviewers is an efficient device for securing impartial significant information. This plan has been successfully used for many years by state and district Rhodes Scholarship selection committees.

A typical interview of this kind might follow the following plan: One of three members of the interviewing team is chosen as the chairman. He takes the responsibility for the conduct of the interview, for the pattern of informality and friendliness, the introductions and putting the applicant initially at ease. This responsibility is rotated for successive applicants. Before the applicant is admitted to the interviewing room, the members of the team familiarize themselves with the applicant's records and decide upon an opening and two or more alternate questions. For example, if the applicant were a football player a lead-off question might be: "What is your feeling about the paying of college athletes?" In the development of his answer the applicant may be led carefully over the past ten years of his life; and his opinions on a variety of issues ascertained by skillful encouragement, a smile, a nod of the head, or a simple comment. Twenty minutes are ample for such an interview; at its conclusion the applicant is asked if he has any questions. If so, these are answered and the applicant is thanked for the interview. At no time do the interviewers allow the applicant to feel that the interview is other than eminently successful. Immediately following the interview the three members of the team summarize their evidence and come to a conclusion. The disposition of the applicant may be arrived at immediately. An alternate plan is for the interviewing team to summarize their findings and recommendations and submit these with the records of the applicant to the chairman of the Committee on Admission for final action.

James B. Duke, in establishing the University bearing his name, requested that[4] "great care and discrimination be exercised in admitting as students, only those whose previous records showed a character, determination and application evincing a wholesome and real ambition for life." In order to carry out this request the method of selecting medical students used at the Johns Hopkins University School of Medicine since 1924[5] was instituted at Duke. The application forms were enlarged to include a maximum of information; the candidates were requested not to send letters of recommendation but to ask three of their science teachers to write directly to the Committee on Admissions. From these is obtained a confidential opinion of the candidate's past performance. The applicants are requested to enclose a recent photograph and a statement of from 150 to 300 words in their own handwriting of their general activities and intellectual interests at college and of their reasons for wishing to study medicine. This statement is extremely useful in forming an estimate of the applicant's maturity, an idea of how he spent his life thus far, and his motivation for the study of medicine. Upon receipt of the application and the letters of appraisal

from the science teachers, the academic record is examined. If this is satisfactory and if the candidate is well recommended, he is asked to make an appointment for a personal interview, with the five members of the Committee on Admission if he lives within 200 miles of Durham, or if he lives at a greater distance, with one of the 61 regional representatives of the Committee.

Outstanding physicians and medical alumni have been chosen in strategic locations throughout the United States to represent the Committee on Admission in order that a personal interview may be obtained with each candidate whose college record and recommendations are satisfactory. The regional representatives have co-operated well with the medical school and their evaluation of the candidate is of great value in the selection of outstanding students throughout the country. Their appraisal is a personal opinion of the candidate's intelligence, character, interest in people, motivation for the study of medicine, health, personality, and financial status. When all of the data have been assembled, a decision is made by the five members of the Committee on Admission, who review independently each of the acceptable records and vote on each candidate. The members of the committee are charged with the responsibility of seeing that each applicant is competing with the other applicants on three points: (1) preparation, (2) intelligence, and (3) character. If there is a majority of doubt in regard to any of his qualifications the applicant is rejected and notified immediately. It is estimated that 2 hours and 10 minutes are spent on each accepted applicant. The Committee on Admission keeps complete records on all applicants who are admitted on small cards.

The remainder of this paper is an analysis of data obtained from these cards. Correlations were run between college grades and success in medical school. There was a positive correlation between grades obtained from a selected group of colleges and universities not only with grades in medical school, successful graduation, but with grades received on National Board Examinations. A few students obviously "find themselves" in medical school for their grades in medical school followed a plane that might not have been anticipated from their college records, or the Aptitude Test. A comparison of recommendations and success in medical school revealed that the important thing was where and from whom the recommendations were obtained. An interesting finding was that students who had received all of their premedical preparation at our institution were more successful than were those who had had part of their training at several colleges.

From 1930 through 1943, there were 990 medical students admitted to Duke University School of Medicine. Of these, 837 were graduated; the remaining 153 failed to be graduated for the following reasons: 97, scholastic; 32, voluntary transfers and withdrawals for financial reasons; 8, personality, dishonesty, alcoholism, etc., and 6, illness. The student mortality for all reasons was therefore 15.4 per cent. The percentage of students who failed to be graduated was slightly higher in those seen by regional representatives than in those seen by our Committee on Admission.

For the 1942 Duke class, 724 applicants were rejected. A study of their records, compiled by Fred C. Zapffe in the office of the Association of American Medical Colleges, indicated that no information was available on 12, and that the remaining 712 applicants wrote 5,796 applications or an average of 8.1 applications per applicant. Two hundred and sixty-three of the 712 (36 per cent) were successful in gaining admission to other medical schools. Slightly more than 50 per cent of the rejections for the year 1942 came from six states: New York, 153 (21 per cent); Pennsylvania, 67 (9.2 per cent); New Jersey, 60 (9 per cent); California, 48 (6.7 per cent); Massachusetts, 38 (5.2 per cent); and North Carolina, 34 (4.6 per cent).

CONCLUSION

This analysis of our experience in the selection of medical students only aggravates our feeling that the various techniques used leave much to be desired. Our data only add to well known contentions. Nothing in this study lessened our respect for the various methods in vogue to the extent of deleting any of them. Even if the perfect method of selecting medical students were available, certain virtues of the personal interview would still hold. We feel that evidence of past performance (grades, records, etc.) and the personal interview are our most reliable criteria for the selection of successful medical school students.

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The Professional Aptitude Test, 1947
A Preliminary Evaluation*

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INTRODUCTION

The fact that the Freshman class of the School of Medicine at the University of Utah enters the university at the beginning of the Summer quarter instead of the Fall quarter has provided an opportunity to make a preliminary study of the predictive value of the Professional Aptitude Test. The first Utah class to participate in the national aptitude testing program held on January 11, 1947, entered the university in June, 1947. Therefore, first quarter medical school grades and aptitude test scores have been available for our fifty freshmen students since the first of September.

Plans were made to take advantage of this opportunity. With the help of the members of the Admission's Committee it was decided:

1. To investigate the reliability of our first-quarter marks in gross anatomy and histology as indices of scholastic achievement in medical school work.

2. To select our class of freshmen in terms of marks earned in premedical subjects, Professional Aptitude Test scores, and the Dean's evaluation of the candidate following a personal interview.

3. To subject the students selected to three additional tests: the Scholastic Aptitude Test for Medical Students (Moss), Form 1; the Strong Vocational Interest Blank for Men, and the Minnesota Multiphasic Personality Inventory.

4. To correlate the marks earned by our freshmen students during the first quarter in residence with the scores they achieved previously on the various tests.

5. To attempt a preliminary evaluation of the Professional Aptitude Test as an instrument for selecting students for medical training.

FINDINGS

The importance of establishing the reliability of the first quarter marks as a scholastic success criterion is obvious. There is no point in relating test scores or marks earned in premedical courses to beginning grades in medical school work unless it can be shown that beginning grades are in turn related to final scholastic achievement in medical study. We, therefore, began our investigation by correlating the combined first quarter grades in gross anatomy and histology for eighty-two (82) students with the final honor point ratios

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earned by them at the time of graduation or interruption.[1] The process revealed a coefficient of correlation of .80. This unusually high correlation, which compares favorably with the coefficients of reliability reported for many standardized tests, must be the result of careful testing and marking in medical school courses.

Scores achieved on the new Professional Aptitude Test and on the old Scholastic Aptitude Test (Moss), Form 1, were discovered to be related to first quarter marks in medical school work as indicated in table 1.

TABLE 1. CORRELATIONS BETWEEN MEDICAL APTITUDE TEST SCORES AND FIRST QUARTER MEDICAL SCHOOL MARKS.

Test Score	Coefficient of Correlation
Professional Aptitude Test	
Verbal Ability	
Scientific	.23
Social	—.08
Humanistic	—.22
Composite	—.10
Quantitative Ability	.19
Index of General Ability	.02
Premedical Science Achievement	.24
Scholastic Aptitude Test for Medical Schools, (Moss)—Form 1	.44

The relationships between marks earned in premedical courses and first quarter marks in anatomy and histology are indicated in table 2.[2]

TABLE 2. CORRELATIONS BETWEEN MARKS EARNED IN PREMEDICAL COURSES AND FIRST QUARTER MEDICAL SCHOOL MARKS.

Premedical Courses	Coefficient of Correlation
All Premedical Courses	.34
Premedical Science Courses	.50

In analyzing the findings, it is important to keep in mind that, where the sample is fifty, a coefficient of correlation should be at least .25 to be significant statistically. There is some doubt, therefore, that any characteristic measured by the new Professional Aptitude Test is positively related to first quarter marks in medical school courses. In fact, there is an indication that at least one of the characteristics—humanistic verbal ability—may be related negatively! In any event, it appears that general scholastic ability is not a discriminating factor in a group which is relatively homogeneous in respect to intelligence. So far as these freshmen are concerned, therefore, the old medical aptitude test, based wholly on science achievement, appears to be a more efficient instrument for predicting scholastic success than the new test of professional aptitude.

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1. All of the graduates of the School of Medicine from June, 1944, to June, 1947, were included. In addition, the figure also includes several students who dropped out "failing" or who transferred to other medical schools during the same period of time.

2. Other interesting correlations discovered during the course of this investigation are the following: Index of General Ability vs. Medical College Aptitude Test (Moss), Form 1, .40; Index of General Ability vs. Marks Earned in all Premedical Courses, .12; Index of General Ability vs. Marks Earned in Premedical Science Courses, .05; Premedical Science Achievement vs. Moss Medical Aptitude Test, Form 1, .54; Premedical Science Achievement vs. Marks Earned in Premedical Science Courses, .33; Moss Medical Aptitude Test vs. Marks Earned in all Premedical Courses, .32; Medical College Aptitude Test vs. Marks Earned in Premedical Science Courses, .34; Marks Earned in all Premedical Courses vs. Marks Earned in Premedical Science Courses, .39.

The findings contained in table 2 also indicate the importance of an index of science achievement in predicting success in medical school courses. The "cultural" subjects may be important for many reasons, but they seem to be inefficient as predictors.

Although this study is concerned primarily with predictions of scholastic success, scores on the Strong Vocational Interest Blank, for Men, and scores on the Minnesota Multiphasic Personality Inventory were secured for our fifty (50) entering freshmen and analyzed as supplementary data. We discovered that only six (6) of our students achieved "C" ratings on the interest blank and that seven (7) performed "abnormally" on the Multiphasic.[8]

After inspecting the assembled data, the following minimum standards seemed to be significant in identifying the students who are making satisfactory scholastic progress. Thirty-three (33) of the (50) freshmen met these standards:

1. A raw score of 152 on the Scholastic Aptitude Test for Medical Schools (Moss), Form 1.
2. A general ability scaled score of 450 on the Professional Aptitude Test.
3. A premedical science achievement scaled score of 450 on the Professional Aptitude Test.
4. An over-all honor point ratio of 1.65 in courses taken in premedicine.
5. An Honor point ratio of 1.50 in science courses taken in premedicine.
6. A "normal" Minnesota Multiphasic Personality Inventory Profile.
7. An "A" or a "B" rating on the physician's scale for the Strong Vocational Interest Blank.

The Admission's Committee of the University of Utah Medical School plans to use these findings in selecting freshmen for 1948. All applicants will be required to take the Professional Aptitude Test, the Strong Vocational Interest Blank, and the Minnesota Multiphasic Personality Inventory. Marks earned in premedical science courses and the score made on the science achievement section of the Professional Aptitude Test will be considered the most essential criteria. Selection will be thought of as a kind of clinical process, and the related data will be used to sharpen committee judgments.

The apparent failure of the index of general ability score, (a composite measure of verbal ability and quantitative ability) as a predictor of scholastic success in medical school merits further comment. Is the Professional Aptitude Test geared to the right objectives?

In demanding that all medical school applicants take as lengthy an examination as the Professional Aptitude Test one must be sure that the content of the test gives the answers we desire. Its only value can be that of predicting

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8. The Strong Vocational Interest Blanks were scored for the physician's key. The blank attempts to measure the degree to which a student's interests are the same as those of successful practicing doctors. An "A" rating is interpreted as "the same," a "B" rating as "probably the same," and a "C" rating as "not the same."

The Minnesota Multiphasic Personality Inventories were scored for all of the validity and clinical scales. A student's response was classified as "abnormal" when one or more of his clinical scores varied as much as two standard deviations from the mean established for the general population.

scholastic success. A basic understanding of biology, chemistry and physics can be tested reliably by science achievement scores. However, more than one-half of the time is allocated for the testing of general scholastic aptitude and general education. The Professional Aptitude Test has already been altered for 1948 and the premedical science achievement portion reduced from 135 minutes to 90 minutes, and 90 minutes of testing of "understanding of modern society" has been added. In our advocacy of broad cultural training for medical school applicants have we written our desires into this test rather than into the curriculum? Or may it be that our applicants have a broader general knowledge than we suspected?

SUMMARY AND CONCLUSIONS

This study of fifty freshmen students who entered the School of Medicine at the University of Utah in June, 1947, was undertaken to discover the predictive value of the new Professional Aptitude Test. The reliability of first quarter marks in medical school work as a success criterion was investigated as well as relationships that exist between first quarter marks and aptitude test scores. Some comparisons were also made between marks earned in premedical courses and marks earned during the first quarter in medicine. To generalize on the basis of fifty (50) cases may be dangerous. On the other hand, it seems to us that the findings do imply the following:

1. The new Professional Aptitude Test is geared to objectives that are quite different from those that dominate the medical curriculum. That is, the test is set up to measure general ability and general education as well as science achievement. The fact still remains, however, that only the science achievement items were found to be related significantly to success in medical school work.
2. Marks earned in premedical science subjects remain the best single predictors of success in medical school courses. They are considerably better than the science achievement score on the new Professional Aptitude Test and probably better than the total score on the Scholastic Aptitude Test for Medical Schools, Form 1.
3. As a sheer predictor of success in first quarter courses, the old Scholastic Aptitude Test for Medical Schools, Form 1, is superior to the new Professional Aptitude Test.
4. If the aim of Admissions Committees in medical schools is to select students with high scholastic aptitude, a broad general education, and superior achievement in science, the findings of this study suggest that it would be best to use as criteria, first, the marks earned in premedical courses in science and, second, the scores achieved on the new Professional Aptitude Test.
5. The selection of students for medical training will always be a matter of judgment to a degree. School marks, test data, and various standardized inventories, therefore, should be regarded as devices to sharpen these decisions.

Rural General Practice in Groups*

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In 1860, the ratio of physicians to the population was higher in rural than in urban areas.[1] Now, however, one of the greatest problems in medical care is the dearth of physicians in country districts.[2] In some counties, even before World War II, the ratio of physicians to the population was as low as 1:5,164,[3] though 1:1,000 is necessary, especially in the country. This shortage is even worse if it is remembered that in some states, 77 per cent of the physicians in the rural areas are more than 50 years of age, in contrast to 43 per cent of those in the cities.[4] Expressed in another way, 51 per cent of the young graduates located in places under 5,000 population in 1906, but only 9 per cent of the class of 1920,[5] although 48 per cent of the population lives in communities under 5,000. There are at least five factors responsible for the present lack of rural general practitioners: (1) the medical schools, (2) too few country medical students; (3) the teaching hospitals; (4) the dearth of rural hospitals, and last, but not least, the present erroneous conception of country practice.

1. The medical schools are largely to blame for the drift away from general practice. The medical student sees the undiagnosed problems sent to his hospital by the family doctor and feels very superior to him because with all of the available facilities, the clinic is able to provide the solution. However, the intern and student forget that the general practitioner has successfully diagnosed and treated the other 85 per cent of his patients without this elaborate setup. Furthermore, the clinical branches in all medical schools are taught by specialists and, perhaps unconsciously, they instill into the students the idea that their specialty is more important than general practice. More medical schools should follow the example of the Bowman Gray School of Medicine of Wake Forest College in having a course in family practice for third and fourth year students, in which the common problems encountered by physicians in caring for patients at home are discussed and illustrated by actual case histories. Emphasis is placed not on the diagnosis and treatment of major diseases, but on the management of minor complaints and on the physician's relationship to the patient's family and to other physicians. Every medical school should have alert, capable, progressive, general practitioners on its faculty to devote an hour or more a week to giving the upper classmen the benefit of their ripe experience. Another way to interest students in family practice is to let them serve as junior interns for private patients as well as for those on the public wards.[6]

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The curriculum also must be molded to fit the requirements of general practice. As expressed by the British Inter-Departmental Committee on Medical Schools, which also is facing a need for more family doctors, "In deciding the importance that should be attached to the various subjects and the type of instruction that should be given, the bias should be towards the needs of the future general practitioner. The basic training should be equally valuable for the student who has the inclination and ability to become a specialist."[7]

In revising the curriculum to fit the needs of family doctors, the pediatric departments have a heavy responsibility.[8] Pediatrics is not a specialty comparable to surgery, neurology and orthopedic surgery, but is, instead, general practice limited to children. A pediatrician is more closely related to a family doctor than any specialist. Physicians in general practice spend a large proportion of their time in pediatrics. Bass recorded that more than 20 per cent of the daily work of Louisiana general practitioners was with children,[9] in North Carolina, it is 34 per cent,[10] and the experience of others has shown that as high as 60 per cent of family practice is in the age group below fifteen years.[11]

Some of us are doing all we can to dissuade students from specializing by emphasizing the opportunities in general practice, but it is difficult to persuade medical and surgical faculties that they owe something to the provision of more family doctors. As previously stated, too many medical teachers give only lip service to the need for training more general practitioners, and do not explain to their students the advantages of going into this field. Our school hopes to encourage more students to go into rural practice by arranging with several family doctors to take senior students into their general practice as an elective preceptorship for two weeks, a program which has been tried in California.[12]

2. Graduates tend to return to the environment to which they are accustomed.[4] Therefore, one of our problems is to devise a plan to get more qualified medical students from the country. They are the ones from whom the rural practitioner must be recruited. The country lawyer, the country teacher, the country banker and business man, as well as the country doctor, do not come from the cities; they come from the country.[13] At present, only 4 per cent of the Duke students are sons of farmers or come from small villages. Perhaps one of the reasons is that the rural high schools may not furnish an adequate preparation for premedical and medical education. Probably the best way by which a sufficient number of country students can attend medical school is through an active recruitment campaign for keen students from rural areas,[4] and through the provision of interest bearing loan funds for part of their education, which can be repaid over a period of years.[14] The radio, newspapers, health departments, country physicians and people should encourage good rural students to study medicine.

Organizing new medical schools, as mentioned below, and taking all of the country students who apply are not the answers. Students from rural areas who give promise of being a credit to themselves and to their university should be given preference over city students, but a sound standard of selection should

be maintained. Otherwise, the percentage of failures is high, which is a waste of the taxpayers' money, or the duds are graduated, which is a crime against the State, to use a Russian phrase. The rural areas need good family doctors and a good student usually becomes one almost regardless of the type of his instruction. On the other hand, good teaching will rarely make a good physician out of a poor student.

3. The larger hospitals, especially the teaching hospitals, also are responsible for the dearth of family doctors because most of them have "straight" services. Though straight internships, which lead to residencies, provide excellent training for specialists, they are excessive in number; often due to the selfishness—sometimes unintentional—of the head of the service who knows that residents make it easier to care for the patients on his service. On the other hand, the ordinary rotating service of one year does not provide more than a smattering of several subjects, with too much time allocated to surgery. What is needed are more two year "mixed" internships covering medicine, psychiatry, obstetrics, pediatrics and surgical diagnosis, which are designed to train graduates for general practice instead of being planned primarily for specialist training and the convenience of the teaching staff.

All graduates, and especially those desiring to enter general practice, should spend at least two years in hospital work. The general practitioner needs a sound scientific background as much as if not more than a specialist, so that he may be capable under all circumstances of advising the family whether the patient needs to consult a specialist.[15] A rural physician needs a more prolonged and better training than a city practitioner, for he must be able to meet his problems unaided.[16] Family doctors will continue to be scarce until more teaching hospitals organize these two year mixed internships. Not only will graduates then receive the requisite training, but even more important, when they realize that the teaching hospitals give preference to training for general practice over that for the specialties they will appreciate the dignity and desirability of being family doctors. The teaching hospitals also can help general practice by coordinating their facilities with smaller hospitals or health centers which desire this affiliation.

The best compromise we could accomplish at our hospital was to provide a straight service in medicine for one year and a split service of obstetrics and pediatrics for another year.[16] However, the residents in these services still encourage the graduates who are planning to go through the residency and slight those who intend to go into general practice.

The teaching hospitals and medical schools also must make general practice more interesting by providing more postgraduate opportunities for the family doctors in their vicinity. Perhaps more important, they must devise methods of encouraging these physicians to attend. Most general practitioners wish to take postgraduate work each year but, like house repairs, they postpone the effort. Setting aside definite dates for the physicians in certain counties might act as a reminder. At Duke, for the past seventeen years, every physician has been welcomed at all clinics, and postgraduate internships for one or two weeks are

available. Except for 122 general practitioners sent by the Board of Health in setting up the child care clinics in the State, financed by the Children's Bureau, only twelve physicians have availed themselves of our invitation. Since V-J Day, an extensive postgraduate program has been organized at Duke with the aid of the W. K. Kellogg Foundation. Ten civilian physicians have attended! On the other hand, 195 returned medical officers have taken this postgraduate work. Unfortunately, most of them are planning to become qualified for the specialty boards.

4. The availability of hospitals is another weighty factor in attracting recent graduates to practice. The young, highly trained physician of today does not feel that he can practice modern medicine without access to a hospital. Even though more than 85 per cent of patients can be and are properly cared for in their homes or in the physician's office,[17] the laboratory and x-ray facilities of a hospital are essential for the diagnosis of many conditions. The effect of rural hospitals in attracting young physicians is illustrated in North and South Carolina. Although the number of prewar graduates going into rural practice was falling all over the country, North and South Carolina had an 8 per cent increase in country doctors before the war. This was due to the support of rural hospitals by the Duke Endowment; with the improved medical service in the country young physicians practiced there. Of the recent prewar graduates who settled in North Carolina, only 10 per cent located in communities without hospitals.[6] In rural areas in which the towns are too small to support an individual hospital or the population is too scattered to maintain a combined hospital, a health center with a nurse, technician and a few obstetric and emergency beds, and affiliated with a medical center, would increase the physician's effectiveness and improve rural medical service. If the Hill-Burton Bill is implemented with sufficient funds, the building of hospitals and health centers in areas in which they are needed will help attract young graduates away from the cities. Not only do rural communities need hospitals and laboratory facilities but equally as important, if they have a hospital, they require financial assistance to enable the people to use the hospital. The Blue Cross Hospital Association for those who are self supporting, and county, state and federal funds for the indigent seem to be the logical answers.[18]

5. The present conception of country practice, which is largely erroneous, also is responsible for the scarcity of physicians in the South or in any other rural area. At present, owing to the improvement in farming conditions but more especially to the dearth of physicians and to the absence of competition, the incomes of the keener rural doctors not only are not less than those of their urban brethren, but they are even better if the cost of living is considered. Perhaps economics and the law of supply and demand will force a trend to general practice. The maintenance of a practice and of a hospital obviously is more difficult in an area with fifty-three people per square mile (the average in the Southern states) than in one with 286 (the Northern average). Improved roads, however, have greatly reduced the time consumed in making visits. Furthermore, the public is rapidly realizing that going to a physician's office with

its equipment gives them better service than does a home visit. In North Carolina, 65 per cent of a general practitioner's practice is now in his office.[10] Rural life is all right if one likes it. Those of us who were reared in the country appreciate its charm. The movies, radio and better roads are rapidly ameliorating the isolation and lack of amusements and are improving the living conditions.[16] Therefore, as stated above, more rural students must be recruited into medicine.

The main objection to general practice is overwork. The long, irregular hours and night calls persuade many of the younger graduates to go into the specialties. However, many family physicians have established an appointment schedule which is successful except for obstetrics and emergencies. More general practitioners also are practicing in groups. Wingate M. Johnson[6] and Henry B. Mulholland[19] probably were the first to introduce the distinction between "Group Practice" and "Practice in Groups." The former consists of reference or diagnostic groups of specialists or of service groups of specialists and general practitioners.[20] Though they are successful in urban areas, and provide excellent diagnostic service for the 15 per cent of patients who require it, they are not the solution of the problem of the distribution of medical care in the South, which is largely rural.

On the other hand, if two or more family doctors join forces to practice in groups, either as a partnership* or merely to share offices and expenses, they would eliminate many of the objections to rural practice. Such a combination enables each of them to assume a major interest without necessarily limiting his work to a specialty. Overhead expense can be reduced by the use of a common reception room and by sharing laboratory facilities and office personnel. Another advantage is that, by substituting for one another on afternoons off, the members of such a group can have more free time without loss of income.[6] Such practice in groups would enable a family doctor to go away for postgraduate instruction without feeling that the community had been left in dire straits. Vacations, too, would be taken with a much easier conscience. Furthermore, I am sure that most of us would do better practice, enjoy it more, and get more mental stimulus from it, if it were subject to the scrutiny and help of our colleagues.[10]

Another difficulty in persuading young graduates to go into general practice is their erroneous feeling that it does not carry the same dignity as that of a

*Partnerships range all the way from keeping the income for each partner separate to dividing the pooled income on a percentage basis. Some young physicians who are starting with an older established practitioner are placed on a salary or guaranteed income for the first few years. One of the most successful arrangements consists of the older physician providing all of the overhead, including transportation, and paying the new doctor 50 per cent of all he collects for the first five years. This plan stimulates the younger man to carry a larger share of the load, especially night calls. After the fifth year, the younger man shares the total expenses and income on a 35 to 50 per cent basis.

The objections to partnerships based on the fear that doctors cannot get along together or that patients will always insist on seeing the same physician on each call seem overrated. Physicians must learn to get along together if they wish to maintain modern family practice. After the patients realize the advantages of having continuous medical service always available, most of them are completely satisfied with the physician who happens to be on call.

In one successful Virginia group of general practitioners, each individual has emphasized some phase of practice, but does not consider himself a specialist. One oversees the laboratory, the other knows more about electrocardiograms, and a third emphasizes some other field of medicine. Before this group got together, 75 per cent of their work was done in the home. Now that the populace knows that they can get better medical care by coming to the office, 75 per cent of the patients are seen in the office and 25 per cent at home.[10]

specialty. Since the specialty boards were created, the students have increasingly obtained the impression that general practice is what the specialists discarded. This feeling has been intensified by the preferential treatment of certified specialists by the Army, Navy, Children's Bureau, Workmen's Compensation Commissions, and many hospitals. As a matter of fact, general practice is just as much a specialty as pediatrics, and the present misunderstanding might be corrected if general practice had its own specialty board and requirements, as has been done in Indiana. It also is possible that such a board might create another level of so-called "overlords," and still leave quite a group who feel that they are inferior and have an inferiority complex.[19]

More recognition of the general practitioner would do much to improve his status in the minds of patients and young physicians. He should be given a staff appointment in teaching centers. A competent and successful general practitioner assigned to each specialty service would act as an advisor to the chief of that service in regard to those parts of his specialty which should be emphasized in the training of general practitioners. General practice services also should be established in military and veterans' hospitals. These services could diagnose and treat the routine, but not necessarily minor, conditions which usually are handled by general practitioners. They would provide excellent training for future general practitioners, would relieve the specialty services of the routine so that their energy might be devoted to cases requiring such highly trained skill, and would enhance the prestige of the general practitioner in the mind of both patient and young physician.[21]

The hope that the specialty boards might limit the number of specialists has proved to be a delusion—they have unwittingly encouraged an increase of specialists by making the specialties seem more desirable by their exclusiveness.

The thought that the increasing number of pediatricians might help supply the need for general practitioners in some areas also is futile because in North Carolina, for example, they have located in the larger towns, represent only 3 per cent of the medical profession, and provide only 7 per cent of the total volume of child care.[10]

It has been suggested that rural medical care might be supplied by requiring all graduates to practice two or three years in the country with a limited license, after completing their internships,[22] a plan which is being used in Mexico and the Argentine.

Subsidization has been unsuccessful. It has failed to move more than a handful of physicians into rural areas. Scholarships from the Commonwealth Fund to 142 medical students on the condition that they practice at least three years in small towns, did not keep all of them permanently in the type of community that most needed their services.[23] Perhaps if the students who had received this aid had been country boys, and if more rural hospitals had been available, more of them would have stayed in the country.

The rural communities themselves also have a responsibility in this problem. They can attract physicians by a reasonably high community income level,

good roads, modern homes, good offices, good schools, good community life, education of rural people to induce them to go to local doctors rather than to those at a distance, hospital or health center facilities, sound public health services, and substantial enrollment in medical and hospital prepayment plans.[23] Other villages can do what Emerson did in Concord, Massachusetts, through libraries, schools, lectures, social circle, etc.[24]

Unfortunately, there is a trend toward a concept that only specialists are competent to treat patients. During the war, the serviceman, for many complaints of relatively simple character, was referred to the hospital specialty outpatient clinics and, when hospitalized, his case was controlled completely by men who were considered specialists. If he had complaints in two different body systems, almost invariably he saw two doctors. Is it unreasonable to expect that he may emerge with the impression that only specialists are capable of treating him? More and more common is the patient who feels that his differential diagnostic acumen is such that he can select the proper specialist without benefit of advice from his family doctor.[21] The specialists often are responsible for this trend. Too many of them tell patients who are referred by family doctors, "Why didn't you come earlier?" They also may fail to return patients to the general practitioner, and encourage them to return for treatment which the family doctor can perfectly well carry out.

A radio and newspaper campaign program, therefore, is necessary to educate the public that the family doctor should take care of the routine ills of all members of the family and refer them to appropriate specialists when occasion demands. A patient receives better care by consulting his general practitioner before seeking the attention of a specialist. No past or personal history, however skilfully taken, can approach in comprehensiveness the knowledge possessed by the family doctor who delivered the patient, treated him for his childhood diseases, advised him prior to marriage, nursed him through his period of mental depression, and watched the gradual rising of his blood pressure. By having cared for his parents, siblings, wife and children, the general practitioner may know more of his family problems than the patient himself. The importance of seeing the patient as an integrated personality in his natural environment has been emphasized strongly by the writers on psychosomatic medicine. Can any specialist approach the family physician in his opportunity to do this?[21]

Five basic criticisms have been leveled at the system of general practice: (1) The general practitioner, on occasion, may fail to differentiate between the trivial and the serious, and may not refer patients to specialists at the proper time. The answer is for the general practitioner to become more proficient in differential diagnosis, as mentioned above. (2) A family doctor may not observe the limitations of his training, and because he has had some surgical experience during his internship, is tempted to do abdominal and nose and throat surgery, and complicated obstetrics which should have been referred to a hospital. The general practice service in teaching hospitals will do much to clarify in the minds of many young physicians the limits within which they can safely practice. (3) Some patients complain that their family doctor does not give

them as thorough an examination as they feel to be necessary. This is particularly true of patients who wish annual "check-ups." Thoroughness in physical examinations would be improved if more medical schools taught "positive health" instead of emphasizing disease. (4) The public avidly reads popular medical articles in newspapers and magazines, and unless their general practitioner can answer the questions arising from these stories, they lose confidence. Every physician should read these popular articles, as well as medical journals. (5) As previously mentioned, many general practitioners talk about their need for postgraduate training, but few take it. These criticisms, while serious, are susceptible of being corrected, and are directed at certain individual physicians and not at the system of general practice.[21] However, general practitioners, by setting their house in order and making it more attractive to young graduates, can greatly help the medical schools, hospitals and public in increasing the number of family doctors.

The question, "Is the profession overspecialized or is the general practitioner doomed?" is easily answered. At present, among the 132,284 practicing physicians under 69 years of age, 57,544 are regarded as specialists of whom 28,476 are certified by the various specialty boards. In addition, 13,300 of the returned medical officers desire to become specialists.[25] That more than 53 per cent of the physicians in this country are, claim to be or plan to become specialists certainly indicates an oversupply. On the other hand, a well trained general practitioner can and does successfully treat 85 per cent of disease. His volume enables him to treat his patients at a lower cost. The public needs and wants more general practitioners. Unfortunately, less than 25 per cent of the present American medical graduates (even lower among the returning medical officers),[25] intend to become general practitioners. These are needed by 85 per cent of the patients. This is an indication not only of the overcrowding of the specialties but also of the urgent need and wide open opportunities for general practitioners.[26] How great this demand is for general practitioners is evidenced by the urgent requests I have received from 256 communities during the past two years. Every medical school is similarly importuned.[16]

The public must have medical care. The scarcity of family doctors in rural areas is a hazard to the population and to the medical profession. The public will get medical care, by regimentation if necessary. The establishment of new state supported medical schools in Seattle, Los Angeles, Maine and Florida, and for the expansion of the two year schools in Utah, Alabama, North Carolina, Missouri, Mississippi and South Dakota are expressions of the public's demand for physicians. Therefore, the medical schools must study this question of the need for rural practitioners. After all, the chief reason for medical education is the need for physicians and for medical service. Schools of nursing cannot be criticized for the lack of bedside nurses if we fail to provide family doctors.

What this country needs is fewer specialists, and more doctors, like the patient in the following story: A general practitioner was called on an emergency at night to see a patient who had a severe sore throat. Knowing that she

had been under the care of Dr. Jones, a cardiologist, for angina, the general practitioner asked why she had not called Dr. Jones. The patient replied seriously: "Dr. Jones is a specialist. What I need is a doctor."[27] As Dr. D. W. Yandell, president of the American Medical Association in 1872, said in defense of women physicians, "If the people want them, such will be found ready to meet the demand."[28]

CONCLUSIONS

1. There is a dearth of general practitioners, especially in rural areas.

2. The public wants and needs family doctors, especially in the country, and it is up to the medical schools and teaching hospitals to furnish them by:

   (a) The appointment of general practitioners to the faculties of medical schools, the introduction of courses in general practice, and the organization of preceptorships with family doctors.

   (b) The recruitment into medicine of keen rural students and the provision of loan funds for them. They are more likely than city students to return to the country.

   (c) The organization of more two year mixed internships, covering medicine, psychiatry, obstetrics, pediatrics and surgical diagnosis.

   (d) The organization and stimulation of postgraduate study.

3. More rural hospitals and health centers, affiliated with a medical center, should be built and financed to improve medical service and to attract young graduates.

4. More family doctors should form partnerships and practice in groups.

5. A general practice board should be formed.

6. General practitioners should be appointed to the staffs of all hospitals, both private and government.

7. Rural communities should improve local conditions so as to attract physicians.

8. The public should be educated by the radio and newspapers to patronize their local family doctor.

9. General practitioners should improve their medical service, observe their limitations, and take more postgraduate work.

10. The medical profession is overspecialized, and the opportunity for general practitioners is unlimited.

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Relationship Between Success in the Study of Medicine and Certain Psychological and Personal Data*

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Prior to 1910, the greatest problem in schools of medicine was that of finding a sufficient number of students who could pay (a) the tuition rate demanded, and (b) according to Doctor Hale[1] of Harvard, the price of celluloid cuffs for examination notes. The students came to medicine with a variety of educational backgrounds, some with a high school education, some with a few hours of college, some with college degrees, and some with not even a high school education. There were no strict requirements for admission as we know them today. The change in the number of schools of medicine following the report of Abraham Flexner[2] in 1910, limited the number of medical students who could be accepted to medical school. This was the very beginning of a selection procedure; inasmuch as it resulted in a limitation of the number of students who could enter into the study of medicine. Demand for medical training on the part of the student soon outstripped the supply of available seats in the medical college, leading to the necessity for some selection device for picking out the most promising students. Today the committees on admission to medical schools face a tremendous task in making the selection of those who shall be granted the privilege of studying medicine.

The problem of selecting medical students is in reality concerned with two distinct problems:

First of all, there is the problem of selecting students who can and will be successful in the academic work required by the college of medicine. Secondly, there is the problem of selecting students who, once their medical education has been completed, will be successful in the practice of medicine. The assumption is that there is an extremely high correlation between these two distinct tasks: that of succeeding in medical school and that of succeeding in the practice of medicine. A casual observation of some of the difficulties in which physicians find themselves points to the fact that this assumption of a high or perfect correlation is not necessarily a tenable one. The high comparative rate of drug addiction among physicians, as reported by the U. S. Public Health Service, and their reported high correlation between psychological disturbances and the use of drugs is a case in point. However, the fact is that it is much easier to predict grades of medical students than it is to predict a more

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intangible group of factors which makes for success in the practice of medicine. It is no small wonder, therefore, that most of the studies which have been reported before this Association in previous years have been concerned primarily with the prediction of success of medical students in making grades in medical college. This does not mean that medical school administrators have ignored, or are not aware of, the problem of producing competent practitioners in the field of medicine. Rather, in the early exploration in the selection of medical students the most expedient method was to use as a criterion measure of success, the grades earned in medical school.

There were a number of reasons why grades were used. First of all, they were always available in quantifiable form; secondly, they did permit a discrimination of those students who maintained a given academic average and hence were not eliminated from the college.

The number of excellent papers dealing with factors determining success in medical school which have been given before this organization, e. g., the papers by Hale,[1] Jacobsen,[2] Hyman,[4] Vaughn[5] of the Graduate Record Office, and others, all have explicitly recognized the fact that the prediction of future grades of medical students does not tell the whole story about predicting success of an individual in the practice of medicine. Moreover, most of those men have pointed out some of the more important factors essential for success in the practice of medicine. Some of the factors mentioned are: an individual must have the ability to communicate; to compare objectively and evaluate; that he must have the great human virtues of honesty, intellectual curiosity, charity, hope, faith and patience; that he must have a deep interest in his fellow man. The physician has the greatest social responsibility of any professional man in his community. The selection of students who possess these cardinal virtues of character and who, in addition, have the intellectual ability and curiosity to succeed in an exceedingly difficult scientific field, is a problem with which committees on admission to medical colleges are confronted. At present, the extremely important problem of personality structure of the medical student is generally evaluated in terms of personal interviews or, in terms of rating scales such as the one suggested by Huntley.[6] The identification of academic factors important to success in medical school—i. e., intellectual capacity, previous college achievement and scientific aptitude,— as a result of a large amount of work that has been done in the field in recent years, permits their prediction with satisfactory success, even though the criterion used—grades in medical school—is itself a fallible criterion.

This is a preliminary report of a study in which we are attempting to isolate some of the factors that are related to success in the practice of medicine. A by-product of the study is, of course, the data pertinent to prediction of success in medical school. To obtain results that are meaningful, so far as predicting success in medical practice is concerned, one must necessarily start accumulating data on individuals prior to their entrance into medical school. By such a long range research program, it is possible to accumulate data that

may be pertinent to the isolation of factors which are responsible for later success in the practice of medicine. A second approach which could be used (but an approach in which we were limited because of the financial expense involved) is one that undertakes intensive study of successful practitioners themselves. This is an approach which has considerable merit. A study of the characteristics of several thousand practitioners in the field of medicine would undoubtedly yield information which would be extremely valuable to admissions committees in the schools of medicine.

This preliminary report has to do with factors that are related to success in the first year of medical college. There are certain obvious limitations to this study. First of all, the sampling is extremely small. It is made up only of the 77 freshmen who attended the University of Oklahoma School of Medicine during the year of 1946-1947. The very limitation in number obviously limits the generalization of the findings of this report. Secondly, and equally important, is the fact that this group is a very homogeneous group in that by the very best prediction the selection committee of the University of Oklahoma could make, it represents a group of students who would likely succeed in medical school. This has attenuated the resulting statistical indices which have been obtained. As a matter of fact, it is the important factors of attenuation and the use of highly selected homogeneous groups, which has resulted, generally, in the lowered values of the psychometric indices employed in predicting the success of medical students. With these two limitations in mind—that is, first of all, the limitation of the size of the sampling, and secondly, the limitation placed by the homogeneous group—we present the results of this study as they are related to the success in the first year of medical school.

Since this study has been designed on a five year basis, and since we wanted to obtain all possible pertinent information concerning the students, there are a number of factors on which we obtained data that are somewhat remotely concerned with success in medical school: such factors as chronological age of the student on entrance to medical school, marital status, number of months of marriage when the student entered medical school, etc. It was just possible that there might be a relationship between those factors and success in medical practice.

Table 1 is a summary which presents the results of the quantified total of 17 distinct measures of various traits and characteristics of the individual, such as intellectual aptitude, personality, etc. These variables were quantified and the usual correlational technique was applied to evaluate the data. The criterion used was the grade point average earned, the first semester of the first year of medicine, the second semester of the first year of medicine, and finally, the combined grade point average of the first year of medicine. In addition to these data, an individual Rorschach "Ink Blot" Test was given to each of the medical students. (The Rorschach test is a projective type personality test and is generally regarded as being the best available psychometric device for the evalua-

TABLE I.—CORRELATION MATRIX.

	Vocabulary	Reading	Q. Thinking	1st Sem. GPA	2nd Sem. GPA	1st and 2nd GPA	General GPA	Prescribed Courses	Mose Aptitude	Chronological Age	Marital Status	No. Months Married	Classification	Physical Science	Biological Science	Total Science	Degree Held	Total College Hours	USAFI Science	Physician (Strong Interest)	Total PAT	Vocabulary	Reading	Q. Thinking	1st Sem. GPA	2nd Sem. GPA	1st and 2nd GPA	General GPA	Prescribed Courses	Mose Aptitude	Chronological Age	Marital Status	No. Months Married	Classification	Physical Science	Biological Science	Total Science	Degree Held	Total College Hours	USAFI Science	Physician (Strong Interest)
Vocabulary	.92																																							
Reading	.84	.84																																						
Q. Thinking	.68	.62	.54																																					
1st Sem. GPA	.62	.64	.62	.54																																				
2nd Sem. GPA	.61	.62	.62	.46	.82																																			
1st and 2nd GPA	.48	.58	.44	.42	.97	.94																																		
General GPA	.45	.42	.30	.37	.48	.36	.27																																	
Prescribed Courses	.32	.30	.18	.30	.17	.17	.15	.70																																
Mose Aptitude	.51	.49	.30	.34	.24	.14	.18	.31	.18																															
Chronological Age	—.08	—.01	—.01	—.23	—.14	—.06	—.11	.07	.12	—.23																														
Marital Status	—.37	—.32	—.10	—.18	—.03	—.06	—.04	—.19	—.04	—.22	.22																													
No. Months Married	—.18	—.18	—.09	—.16	—.08	—.09	—.09	—.17	—.21	—.05	.38	.70																												
Classification	.12	.13	.13	.02	.07	.06	.07	—.15	.01	.01	—.17	—.10	—.02																											
Physical Science	.16	.16	.15	.09	.17	.25	.21	.01	.01	—.08	—.15	—.07	.01	.12																										
Biological Science	.11	.20	.07	—.15	.15	.14	.15	—.09	—.12	.16	.10	.08	.21	.04	.15																									
Total Science	.17	.24	.13	—.03	.20	.23	.22	—.07	—.09	.06	.40	.02	.17	.03	.42	.37																								
Degree Held	.01	.03	—.02	—.02	.01	—.08	—.08	.06	—.02	.06	.25	.17	.12	—.08	—.08	—.08	.17																							
Total College Hours	.12	.11	.10	.08	.08	—.08	.04	.06	.03	.07	.28	.05	.09	—.07	.18	.20	.25	.78																						
USAFI Science	.69	.56	.58	.66	.30	.42	.37	.33	.29	.34	—.03	—.17	—.12	.03	.19	.02	.11	—.04	.12																					
Physician (Strong Interest)	.08	.16	—.07	.01	—.15	—.10	—.14	.07	.12	.12	—.12	—.26	—.24	.01	.13	.01	.06	—.14	.05	.07																				
Total PAT	.92	.84	.62	.54	.92	.91	.84	.70	.51	.51	—.08	—.37	—.18	.12	.16	.11	.17	.01	.12	.69	.08																				
Vocabulary	.92	.84	.68	.62	.61	.48	.45	.32	.51	—.08	—.37	—.18	.12	.16	.11	.17	.01	.12	.69	.08																				
Reading	.84	.84	.62	.64	.62	.58	.42	.30	.49	—.01	—.32	—.18	.13	.16	.20	.24	.03	.11	.56	.16	.92																				
Q. Thinking	.68	.62	.54	.62	.62	.44	.30	.18	.30	—.01	—.10	—.09	.13	.15	.07	.13	—.02	.10	.58	—.07	.84	.84																			
1st Sem. GPA	.62	.64	.62	.54	.46	.42	.27	.15	.18	—.11	—.04	—.09	.07	.09	.15	.13	—.08	.02	.66	.01	.62	.62	.54																		
2nd Sem. GPA	.61	.62	.62	.46	.82	.94																																		
1st and 2nd GPA	.48	.58	.44	.42	.97																																			
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Mose Aptitude	.51	.49	.30	.34	.24	.14	.18	.31	.18																															
Chronological Age	—.08	—.01	—.01	—.23	—.14	—.06	—.11	.07	.12	—.23																														
Marital Status	—.37	—.32	—.10	—.18	—.03	—.06	—.04	—.19	—.04	—.22	.22																													
No. Months Married	—.18	—.18	—.09	—.16	—.08	—.09	—.09	—.17	—.21	—.05	.38	.70																												
Classification	.12	.13	.13	.02	.07	.06	.07	—.15	.01	.01	—.17	—.10	—.02																											
Physical Science	.16	.16	.15	.09	.17	.25	.21	.01	.01	—.08	—.15	—.07	.01	.12																										
Biological Science	.11	.20	.07	—.15	.15	.14	.15	—.09	—.12	.16	.10	.08	.21	.04	.15																									
Total Science	.17	.24	.13	—.03	.20	.23	.22	—.07	—.09	.06	.40	.02	.17	.03	.42	.37																								
Degree Held	.01	.03	—.02	—.02	.01	—.08	—.08	.06	—.02	.06	.25	.17	.12	—.08	—.08	—.08	.17																							
Total College Hours	.12	.11	.10	.08	.08	—.08	.04	.06	.03	.07	.28	.05	.09	—.07	.18	.20	.25	.78																						
USAFI Science	.69	.56	.58	.66	.30	.42	.37	.33	.29	.34	—.03	—.17	—.12	.03	.19	.02	.11	—.04	.12																					
Physician (Strong Interest)	.08	.16	—.07	.01	—.15	—.10	—.14	.07	.12	.12	—.12	—.26	—.24	.01	.13	.01	.06	—.14	.05	.07																				
Total PAT	.92	.84	.62	.54	.92	.91	.84	.70	.51	.51	—.08	—.37	—.18	.12	.16	.11	.17	.01	.12	.69	.08																				
Vocabulary	.92	.84	.68	.62	.61	.48	.45	.32	.51	—.08	—.37	—.18	.12	.16	.11	.17	.01	.12	.69	.08																				
Reading	.84	.84	.62	.64	.62	.58	.42	.30	.49	—.01	—.32	—.18	.13	.16	.20	.24	.03	.11	.56	.16	.92																				
Q. Thinking	.68	.62	.54	.62	.62	.44	.30	.18	.30	—.01	—.10	—.09	.13	.15	.07	.13	—.02	.10	.58	—.07	.84	.84																			
1st Sem. GPA	.62	.64	.62	.54	.46	.42	.27	.15	.18	—.11	—.04	—.09	.07	.09	.15	.13	—.08	.02	.66	.01	.62	.62	.54																		
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Mose Aptitude	.51	.49	.30	.34	.24	.14	.18	.31	.18																															
Chronological Age	—.08	—.01	—.01	—.23	—.14	—.06	—.11	.07	.12	—.23																														
Marital Status	—.37	—.32	—.10	—.18	—.03	—.06	—.04	—.19	—.04	—.22	.22																													
No. Months Married	—.18	—.18	—.09	—.16	—.08	—.09	—.09	—.17	—.21	—.05	.38	.70																												
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Degree Held	.01	.03	—.02	—.02	.01	—.08	—.08	.06	—.02	.06	.25	.17	.12	—.08	—.08	—.08	.17																							
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Physician (Strong Interest)	.08	.16	—.07	.01	—.15	—.10	—.14	.07	.12	.12	—.12	—.26	—.24	.01	.13	.01	.06	—.14	.05	.07																				
Total PAT	.92	.84	.62	.54	.92	.91	.84	.70	.51	.51	—.08	—.37	—.18	.12	.16	.11	.17	.01	.12	.69	.08																				

tion of the personality structure of an individual.) The data obtained from this test were not completely quantified and, hence, have not been included in the correlational matrix presented in Table 1.

The numbers on that table represent the zero order coefficient of correlation between each of the variables measured. The grade point average for the first and second and both semesters of medical school have been indicated between the black lines shown on the table. One can, therefore, determine the validity coefficient, that is, the degree to which each of the variables measured is capable of predicting the success of the students in first year medicine. It will be seen that the best single variable on which to predict success of medical students is given by the Professional Aptitude Test. This is not the professional aptitude test which was given to students in January, 1947, but is a preliminary experimental form of the first half of that aptitude test. That is, this test which was given in experimental form to our medical students in their freshman year was a test made up of the unrefined aptitude portion of the Professional Aptitude Test. There was no part of the achievement portion of that test included as a part of this test. The correlation of .48 is quite high when one considers the highly homogeneous group represented by this freshman class. It is of the same magnitude as the usual correlation between success in college and scores on our best academic aptitude tests. It will be seen that of the three sub-tests that make up the Professional Aptitude Test, the test on quantitative thinking shows a slightly higher correlation than the other two sub-tests with respect to grade points earned. The second test which showed a significant correlation with the success of medical students was the USAFI test on Reading Comprehension of Scientific Materials, College level. This test finding is of interest in that it may serve as an aid to premedical committees in the selection of students for medical college. Since there was a fairly high correlation between the USAFI test and the PAT there is no justification for the use of the USAFI test as a selective device for medical school so long as the PAT is being used.

The second interesting group of correlations had to do with the total hours of science taken as an undergraduate and success with the medical curriculum. It will be noted that this correlation is quite low, slightly higher for the physical sciences than it is for the biological sciences. While this result must be generalized with caution, it is suggestive of a general conclusion to the effect that success in the first year of medicine is not enhanced by increasing the number of hours of science taken prior to entrance to medical school. It is to be observed that undoubtedly those students who were admitted with the minimum hours of science did have good grades in the science work taken. It does point to the fact, however, that the grades earned in an introductory course in the field of science are just as good predictors of success as the grades earned in total science. If the goal of medical education is that of producing physicians who have a broad knowledge of the social aspects of the world in which they live, as well as excellent technical training, then this finding with respect to total hours in science suggests that "other things being equal" the student in his premedical

education might justifiably take courses in the fields of the social sciences, the humanities, literature, art and politics, as a portion of that education, and thereby in no way jeopardize the possibility of his success in the college of medicine.

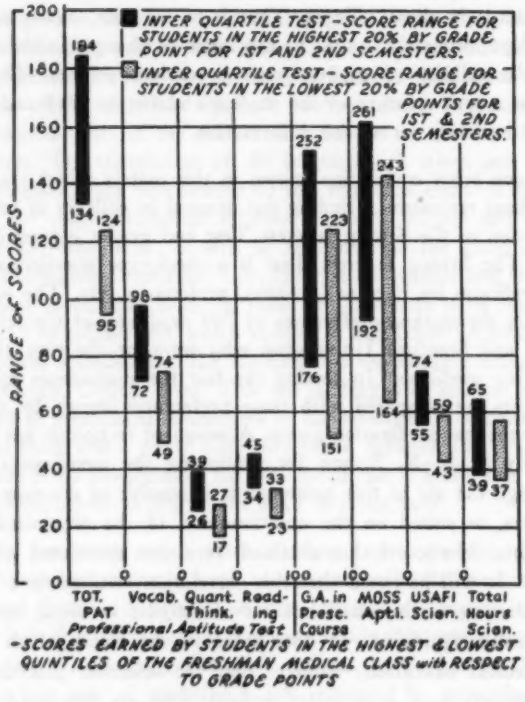
The correlation obtained between grades earned in medical school and the undergraduate grade point average is low. Again, this may be due to attenuation resulting from selection. It does point to the source of error which has been noted previously in the studies of Hurd,[7] Hale[3] and Hyman[4] to the effect that the grade point average of a student in premedical work is meaningless insofar as predicting success of students is concerned, when it is not evaluated in terms of the college where that work was taken, and which does not consider the grading standards in those colleges. That is to say, the admission officer must know the college intimately so that he can know of changes in the faculty which may affect the validity of grades given in various courses. Too frequently, grades are not a true measure of the student's ability to read and comprehend, to think constructively, or to use information.

There is one other correlation shown in this matrix which should be noted in that it perhaps represents a finding not unusual in colleges of medicine. That is the correlation of the Strong Interest Test and grades earned in the college of medicine. The Strong Interest Test is a check-type questionnaire in which the student indicates his likes and dislikes, preferences, etc. The scoring of this test is based on the marked preferences of 769 graduates of the schools of medicine of Yale and Stanford Universities who were, at the time the tests were given, practicing medicine. In scoring the test the preferences marked by the medical students are compared with those preferences shown by the physicians who made up the standardization group. A weighted technique has been worked out statistically by E. K. Strong for evaluating the significance of each response. Through the use of this technique it is possible to compare the interests and preferences, as stated on the questionnaire, of the physicians and of the medical students. The scores thus obtained were then correlated with the grade point average. It will be noted that this correlation resulted in a low negative correlation. Because of the small number of subjects involved, this correlation is not statistically significant. It does point to the trend which may be important in medical education; namely, that the selection procedures used in medical colleges are such as to select students who are interested primarily in basic science and who do not have the measured interest of physicians.

As noted earlier, the scores earned by the students on the Moss Aptitude Test, the chronological age of the student, the marital status of the student, and the number of months married have little significance so far as the prediction of success in first year medicine is concerned. Other variables in which low positive correlations were observed were in the type of school from which the student came. The schools were classified in terms of the type school in which the major amount of premedic work had been done, i. e., teachers' col-

leges, privately endowed colleges, universities, etc. The correlation here may have been reduced because of the selection procedures of the committee on admission.

Graph 1 presents in different form the value of these predictive instruments used in the selection of medical students. The graph shows the interquartile range of the various predictive measures for the highest and lowest twenty per cent of the freshman medical class with respect to the grade point average earned in the first year of medical school. It will be seen here also, that the experimental form of the aptitude portion of the Professional Aptitude Test is the best single predictor of the upper and lower quintiles. Contrasted with



GRAPH I.

this result, it is interesting to note the relative lack of discrimination obtained through the use of the Moss Aptitude Test with respect to the grade point averages earned by this medical class.

THE RELATIONSHIP BETWEEN PROFESSIONAL APTITUDE RESULTS, RORSCHACH RESULTS, AND SUCCESS IN THE SCHOOL OF MEDICINE

If one compares the upper 15 per cent with respect to grade point averages in the school of medicine and the lowest 15 per cent (including those students

who dropped out during the course of the school year, or who failed because of low grades) and asks the question "How do they differ with respect to this mass of data we have?" there are many interesting facts revealed. First of all, let us note the characteristics of the highest 15 per cent.

Table 2 presents summary information on the twelve students earning the highest grade point averages in the medical school freshman class of 77. It will be noted that this chart shows only summary data with respect to the experimental PAT test in the experimental form, and the Rorschach data characteristics. This group includes eleven men and one woman. The mean or average score earned by this group on the experimental PAT test was 160.9. The range in scores is from 121 to 198 and agrees in general with the bar graph distribution which has previously been shown. All of these scores fall within the upper 50% of the distribution

TABLE 2.—SUMMARY INFORMATION ON THE TWELVE STUDENTS EARNING THE HIGHEST GRADES.

Rank of G. P. in Class	Exp. PAT Total Raw Score	RORSCHACH DATA CHARACTERISTICS					
		Color Resp.	Color Shock	Black-White Shock	F + /F—	Approach	Total Response
1	147	12	No	No	1.31	D.dd	53
2	160	1	No	Yes	4.0	D.dd	22
3	198	5	No	No	1.2	W.d	38
4	198	3	No	Yes	1.45	W.d	27
5	178	4	No	No	8.0	W.d	32
6	161	3	No	Yes	2.0	D	32
7	131	0	No	Yes	2.4	D.dd	37
8	137*	2	No	No	2.57	W.D	27
9	134	0	Yes	No	11.0	D	24
10	121	9	No	No	0.75	D.W	58
11	187	8	No	No	2.2	W.D.Dd	43
12	184	0	No	Yes	3.7	D	37
	Mean = 160.9				M = 3.38		M = 35.8

* = Female

of aptitude test scores in the school. However, it will be noted after scanning column 3 that the students who ranked 1st and 2nd in the class were not the students who scored highest on the PAT. Take the case of student No. 1 in the class. His raw score on PAT was 147. Now note the Rorschach results. Over in the next to the last column, total responses of 53, indicative of the high intellectual capacity which this student has. Note also the total of 12 color responses which is unusually high, indicating that the student was capable of experiencing deep emotional experiences, and moreover that the emotional aspect of his life was very healthful. This is further evidenced by the fact that there was no "color" shock, sometimes called "neurotic" shock, because of its diagnostic value with respect to the neuroses. There was not any showing of "black-white" shock which is indicative of a deep-seated anxiety state. The approach which he showed to the whole test configuration was from larger to smaller detail. His F+/F— score, which indicates the degree to which he adjusts to the reality of the world in which he finds himself, is 1.31, below the

average for this group as a whole. With the absence of color and black-white shock it is indicated that here is a student who has a rather wide imaginative and creative intellect and one who is capable of successfully experiencing deep emotional experience.

Now observe the results of the individual who ranks second in the class. He has a PAT score of 160, some 13 points higher than individual No. 1. However, a markedly different Rorschach pattern is observed. Note that this individual did show "black-white" shock, evidence that a deep-seated anxiety condition exists. The total number of responses is down—only 22 responses. This number is much lower than would be expected from his PAT results. One other interesting thing to note in these data is the fact that this individual is very realistically oriented. One may say almost too realistically oriented. His F+/F— ratio is 4, suggesting a limitation of the imaginative and creative aspects of his life. This, of course, has significance in relationship to the black-white shock since the reaction of the student to the experiences which gave rise to the anxiety may be, this tendency of avoiding imaginative and creative experiences.

Moving on to the individual who ranks 4th in the grade point averages of the class. He had the highest PAT total score made by any of the students, a score of 198. Here is an extremely competent individual with respect to intellect. Now notice his Rorschach results, especially the black-white shock, indicating that he too has a deep-seated anxiety. That the anxiety does not interfere too greatly in his everyday experiences is evidenced by the fact that he did make some color responses, 3, and that he showed a comparatively large number of F— responses which would be expected from his high academic learning ability as indicated by PAT. All in all, it will be noted that there were a total of 5 in the 12 outstanding students with respect to grade point average earned in this class who showed black-white shock—an indicator of deep-seated anxieties. In addition, it will be noted that one individual showed color-shock, an indicator of neurotic tendencies on the part of the individual. That means that of the 12 top-ranking students with respect to grades in this freshman class, 6 of them gave indication on the Rorschach test of rather severe personality maladjustment. The group as a whole had one characteristic in common, that is, evidenced by both the PAT score and the Rorschach test—they are of high intellectual ability. From an examination of these results alone one is almost tempted to believe that a maladjusted individual tends to earn better grades in medical school, a suggestion which has been made on the basis of previous personality questionnaire studies. This generalization, however, does have its limitations, as we will see when we examine what has happened to some of the high ranking students with respect to academic aptitude, and how they fared in earning grades.

Table 3 shows summary information on the lowest 12 students with respect to grade point averages in the class. It will be noted that the total raw scores

on the experimental form of the PAT varies markedly from the 12 highest students, the average in this case being 105 as compared with 160.9 for the high group. However, it will be noted that there are some high-scoring students in this lowest group. Take for example, student ranking 68 on G.P.A. with a PAT raw score of 177. Notice the Rorschach results: The total of 77 responses, an extremely high number of responses; but look at the ratio between F+/F—, 0.81, actually a greater number of original or rare responses than common responses made. Moreover, the approach to the responses was one of minute and fine detail, rather than a viewing of the blot as a whole. The pattern of responses is indicative of great phantasy and imaginative activity. While this

TABLE 3.—SUMMARY INFORMATION ON THE TWELVE STUDENTS EARNING THE LOWEST GRADES.

Rank of G. P. in Class	Exp. PAT Total Raw Score	RORSCHACH DATA CHARACTERISTICS					
		Color Resp.	Color Shock	Black-White Shock	F + /F—	Approach	Total Response
77	66	1	No	No	1.5	D.dd	24
76	116	0	Yes	No	1.86	D	40
75	143	0	Yes	No	2.83	D	46
74	95	2	No	No	2.36	W.D	26
73	79	0	No	No	1.33	D	21
72	124	0	Yes	No	1.03	D.dd	61
71	99*	2	No	No	4.00	W.D	25
70	99	0	No	No	2.57	W.D	23
69	114	0	Yes	No	2.40	W	17
68	177*	0	No	No	0.81	D.dd	77
67	121	0	Yes	No	2.40	D	55
66	93	0	No	No	1.04	D.dd	30
	Mean = 105				Mean = 2.01		Mean = 37.25

* = Female

student does not show either color-shock or black-white shock, you will note that there was no color response, indicating a very narrow effective life. The total Rorschach pattern observed here is frequently found among individuals who are schizophrenic and such a diagnosis is suggested here. Three other students are left to be noted. Student ranking 75 who actually "flunked out" of school earned a raw score on the PAT of 143, but who showed color-shock on two different cards and who undoubtedly had a very active psychoneurosis. These 2 students did not complete the year. Then there is student ranking 72 who has a PAT raw score of 124, and who also showed color-shock, but not to the extent of the student just mentioned. Finally, student ranking 67 with a PAT raw score of 121 who showed a limited use of phantasy responses, but who also showed color or neurotic shock, indicating an active neurosis. The total responses for this student, it will be noted, is in agreement with the PAT and suggest high academic aptitude.

The rest of the students in this low group show no unusual Rorschach patterns. In scanning the total number of responses, one obtains a rough indication of the academic potentialities of the students. It will be seen that there is

considerable agreement with the PAT scores. Low intellectual ability, and fairly sound personality structure throughout, yet handicapped in the study of medicine. One other outstanding characteristic of the Rorschach data is the approach they made to the test itself. The consistent D.dd approach, indicating that these students generally had difficulty perceiving problems as a whole, and tended to attack the problem without any understanding of the full significance of the smaller problem and how it was related to the larger one.

Now let us examine some of the test data and see what happened to the other high-scoring individuals on the PAT who did not stand high in the class. Again, scrutinizing the rough qualification of the Rorschach data for a clue as to why those students were not more successful in earning grades in medical school.

When we take the 12 students who scored highest on the PAT in this freshman class, one finds first of all that five of the 12 students were among the 12 who made the highest grades in that freshman class. In addition it has previously been noticed that one of the 12 high-scoring students on the PAT actually "flunked out" of school, that is, was one of the 12 lowest students on grade point average. This was the student previously mentioned who had the schizophrenic Rorschach result. There still remain six students who scored high on the Professional Aptitude Test but who were not among the top students with respect to grades. On examining the Rorschach data obtained on these students, it was found that 5 of the 6 had shown "color" or "neurotic" shock, a positive indicator of an active psychoneurosis. The sixth student showed a typical schizophrenic pattern; an F+/F— ratio of 0.66, indicating that the individual had a marked tendency to live in a world of phantasy. The total number of responses made by this student was 83, an amazingly high number; the approach throughout on the Rorschach was from D to dd — from large to small detail with an almost complete ignoring of the whole configuration. The number of responses containing sexual associations was high, again a characteristic frequently found in schizophrenic patients. Because of the importance which these above indicated Rorschach findings have for the problem of selection of medical students, all of the Rorschach test responses were scored independently by a second test technician. The gross results of the first and second scoring were in perfect agreement.

SUMMARY

From the preliminary data gathered thus far in this study, two outstanding results are to be noted: (1) the comparatively high validity which the experimental form of the Professional Aptitude Test has in the predicting of success in medical school; (2) the differential pattern found in Rorschach results for "over" and "under" achievers as measured by the results of the PAT and the grade points earned in the first year medicine. The most outstanding of these Rorschach results are: (a) that black-white shock in the individual of high intellectual competence is an indicator of over-achievement on the part of the individual; (b) a tendency on the part of the student with the deep-seated

anxiety to over-achieve so far as grades are an indicator of over-achievement. Conversely there is the suggestion that "color" or "neurotic" shock as indicated by the Rorschach results, tends to accompany a lowering of the academic efficiency of the student. It will be interesting indeed to watch the progress of those students which have shown personality defects; to watch how they fare in future work in the school of medicine and later, how they fare in the practice of medicine. The preliminary results of the present study suggest that a far greater amount of work could profitably be done in the area of personality structure as it is related to success in medical school. The caution made at the first of this paper with respect to the limitations of the results reported herein might profitably be repeated at this point: The number of students included in this study is so small that necessarily the results cannot be generalized too widely, but must await the accumulation of more extensive data on a much larger number of students.

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Public Health Training and Research in Britain

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Although preventive medicine has long been taught in the medical curriculum in Great Britain, it has tended to be rather a formal subject designed to equip a general practitioner for part time work as a health officer of a local authority.

Now all this is changing. The emphasis is on the social background of disease rather than on prevention of specific infection and the clinicians, notably in obstetrics, venereal diseases and pediatrics have increasingly raised their heads from the bedside and asked themselves not only what the patient required but how he came to be ill. There are gaps, however, in the teaching of constructive applications of medical knowledge, gaps due to the lack of interest of many clinicians and to the rather rigid teaching of prevention of disease in contrast to the improvement of health.

The solution recommended by the Interdepartmental Committee on Medical Schools of 1944 was that each medical school should have a department of social medicine and that the staff of this department should cooperate closely with the clinicians in teaching not only about the patient and his disease in hospital but about the way of living of the patient before he came to hospital and his progress when he returns again to his own home. By combining medical and social case work in this way we are gradually broadening the student's education in the social aspects of medicine.

The essence then of the current reforms in undergraduate education in Britain is that the emphasis throughout is constructive rather than merely preventive of specific infection, and on human beings as well as their afflictions.

In postgraduate education in preventive medicine there are similar trends. For sixty years in Great Britain medical officers of health have been required to hold a Diploma in Public Health granted after recognized training and examination by a university or college approved by the General Medical Council. Naturally, the knowledge required for such a diploma has been governed by the duties required of medical officers of health. In the early days these officials were concerned with sanitation and were frequently expected also to act as public analysists, and to take charge of infectious disease hospitals. The curriculum was, therefore, concerned with drainage, ventilation and the hygiene of dwellings, with infectious disease control measures and with public health law. It had to include also, however, fairly advanced practical training in the chemistry of food and drugs in bacteriology.

At the beginning of this century, the local authorities began to develop not only health services concerned with sanitation but personal health services such as maternity and child welfare work. At a later date they also became responsible

for providing hospitals. The training of the medical officer of health as the chief official concerned with these matters had inevitably to be altered to equip him for the widened scope of his duties. From time to time, therefore, the diploma curriculum has been modified and recently it has been altered radically.

At present the curriculum is divided into two parts. Part I lasts three months and at the end of the course the graduate sits for the examination for a Certificate in Public Health.

This preliminary training is intended to give a background of knowledge about local authority organization and to introduce the student to the sociological aspects of medicine. Some bacteriology is included, intended mainly to emphasize prophylactic work such as diphtheria immunization, and to put in perspective the value of the diagnostic facilities of a public health laboratory. Similarly an introduction to medical statistics is intended to call attention to the value of vital statistics and demographical data in the elucidation of problems in medical aetiology. The opportunity is taken here to instruct on how to plan investigations intended ultimately to be expressed by statistical methods so that the hoped for results may not be nullified by lack of proper data.

It is intended that doctors who expect to work as clinicians in the personal health services of local authorities should take only the certificate, and that those intending to practice in some branch of preventive or social medicine entirely, should carry on to take Part II of the course which qualifies for the Diploma in Public Health.

The diploma course deals with public health law and environmental hygiene with special emphasis throughout on the social aspects. There is practical work with medical officers of health and visits and demonstrations of industrial conditions, food and drug control, housing and so on. In addition the teaching of statistics is enlarged and special instruction is given in human genetics, in bacteriology, in clinical infectious diseases, and in the work of almoners and other social workers.

During Part II of the course in addition to the formal teaching, the students have to keep a day book detailing their practical work and making comments thereon. The class is also divided into groups which work together on a chosen subject. Each group produces a demonstration illustrating their particular subject, and there is a symposium of short addresses by members of the group. All these activities are assessed in the granting of the Diploma and good practical work will greatly help the student to pass the difficult examination.

The trend of postgraduate teaching is, however, definitely toward specialization in the work which the student intends to pursue. Already, as far as the limits of the curriculum laid down by the General Medical Council allows, specialization in Part II is encouraged by setting a wide range of questions in the examinations and giving such choice to the student that he can pass his examination to a considerable extent on a special subject or group of subjects. It seems likely that in the future it will be customary for all Diploma students

to make a choice in Part II, of working at the subject which specially interests them such as industrial health, sociology, public health or hospital administration, the choice of studies being the student's subject to the approval of his teachers. This will mean much heavier work for teaching staffs in special subjects, but will overcome the criticism that the Diploma course at present attempts to do too much and fails to deal thoroughly with any subject.

Research in social medicine seems to be in three main directions at present, and these are often determined by the background of experience of the workers. The clinician being used to disease entities is tending to follow these diseases back to the homes and occupations of the patients in the endeavor to trace cause and effect. In addition there is much work on assessment of the state of health as opposed to absence of disease. This has led to many studies in growth and development of children and to a renewed interest in optimal nutrition.

Workers with an epidemiological or statistical background on the other hand, are naturally more interested in correlations between specific habits and environmental factors and states of ill health. Great efforts are being made to collect and analyze morbidity as opposed to mortality statistics, because not only are few of the former available, but the practical applications of investigations of causes of absence from work are so relevant to Britain's present shortage of man power. This has led to increasing interest in illness in which the determining cause of absenteeism is the patient's attitude to his illness rather than the illness itself. Experiments are also under way in many areas on rehabilitating such persons.

Finally, the type of research worker whose background is public health work with a local authority is usually most interested in the sociological field on the borders of medicine and sociology. The socially inefficient individual, the delinquent and the lazy; the inefficient or problem families who can never bring up their children properly are subjects of much concentrated work directed towards finding the causes and the cures. As is natural from the close association of health departments with housing problems and with school children, these are subjects of unending research.

There is, of course, overlapping in these groups of researches. All use statistical methods from time to time and all are increasingly concerned with the mental factors in the health of the individual and of the community.

What is so encouraging is, of course, that workers in all fields of medicine are directing their attention to the preventive and social aspects of medicine more than ever before. Medicine is no longer merely curative or even preventive of specific disease, but is formulating means based on scientific knowledge to raise the whole level of health of the country.

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The Flood of Questionnaires

Since the pronouncement made by the Executive Council at its meeting held in Chicago in February, the questionnaire habit has developed into a full-fledged epidemic. Many medical schools have been sending in to the office of the Association the questionnaires received. None of these questionnaires needs to be answered. It was made clear by the Executive Council that any college which wishes to answer any and all questionnaires sent to it may do so, but judging by letters received from the colleges since the announcement notice was sent out, it is very evident that none of these schools is at all desirous to answer the questionnaires unless they really are worth while. Many of the questionnaires thus far received cover ground that can easily be answered by referring to college catalogues, or to studies published by the Association at various times. Other questionnaires are pointless and apparently represent a desire on the part of the sender to get information at someone's else expense, or to satisfy a thought. It is certain that if the attention of those sending out these questionnaires is drawn to the fact that answering them does entail a great deal of work on the college, they would refrain from sending one and dig up the information themselves.

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Another Call to Arms

Doubtless all medical schools are very much concerned about the impending call to arms which will affect seriously medical students and medical men. It will be recalled that in 1945, the Association appointed a Committee on Preparation for War. This committee consists of Doctors Stockton Kimball, Buffalo, chairman; Dayton Edwards, Cornell; George Packer Berry, Rochester. The committee has already submitted two reports, which are published in the proceedings of the annual meetings held in 1946 and 1947. An ad interim report was also submitted to the Executive Council at its regular February meeting. Furthermore, the chairman of the committee has attended two joint meetings with a similar committee set up by the American Medical Association.

Thus, it will be seen that the Executive Council and the Association are fully aware of the trend of public opinion and are endeaving to anticipate action by being fully prepared if and when action is demanded.

At the next meeting of the Executive Council this matter will receive most careful thought not only by the Council but also by representatives of the medical departments of the Army, Navy and Veterans Administration, the United States Public Health Service and the department of government over which Major General Lewis B. Hershey presides. How any action taken by the Government will affect students and faculty will doubtless be elicited at this meeting. Colleges in membership in the Association will be informed promptly after this meeting as to what has transpired.

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Study of Applicants for Admission to Medical Schools

Since 1925, the Association of American Medical Colleges has made a study of the applicants for admission to medical schools; the number of applications made; the number accepted; the number rejected and why rejected. Until the beginning of the war, the results of this study varied little from year to year except in the preparation for the study

of medicine by these applicants. Only once did the number of applicants exceed 13,000. They made about 36,000 applications; about one-half the number made only one application and stood by the result. The highest number of applications for any one applicant was 45 with one acceptance. Incidentally, this applicant failed out at the end of the year. The ratio of acceptances to rejections was never less than 50 per cent, that is, one out of every two applicants was accepted.

The results of this study have been published annually in the JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES. The study was not published during the war years because the Army and Navy training programs, naturally, affected the data ordinarily derived from this study. It was no longer a matter of how many applicants nor how many applications. Most of the admissions to medical schools were by assignment made by the Army and the Navy. The results of this study as applying to the 1947 freshman class are now being analyzed. Because of the fact that so many medical schools did not send the application cards to headquarters until many months after sessions opened makes for a considerable delay in completing the study. One college sent in only those cards of applicants who were accepted. The important item in this study is not how many applications are made, but how many applicants made these applications; therefore to say that so many applications were accepted does not mean anything, because if an applicant made ten applications, only one of which was accepted, it would alter conclusive figures very much. So far for 1947 it can be said that 56,553 applications were made. Of that number 8,048 applications were accepted. Until the number of applicants is available the ratio of accepted applicants to total applicants cannot be given. All of the medical schools in the United States have reported a freshman class enrollment of 6,173. However, even that figure is not definite because some schools do not report on repeaters; therefore, when the school reports on the accomplishment of its students at the end of the academic session the previously reported number of enrollments is always somewhat less than the actual enrollment. On the basis of previous years' experience, the tentative statement can be made that the present freshman class probably numbers about 6,250.

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Survey of Medical Education

The plans for conducting the proposed Survey on Medical Education are still in the process of being formulated. It is hoped that before long a definite pronouncement can be made giving detailed information as to how the survey will be conducted and by whom. As stated in previous announcements, it is a three-year project to be sponsored by the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association. However, the working body will be an entirely independent group.

The objectives of the study shall be to evaluate the present program and determine the future responsibilities of medical education in its broadest aspects for the purpose of (a) improving medical education to better meet the overall needs of the American people for (1) prevention of disease, (2) the restoration, so far as possible, to health of all those who suffer illness or injury, and (3) the maintenance of the best standards of physical and mental health of all the people. (b) Assessing the degree to which medical schools are meeting the needs of the country for physicians. (c) Promoting the advancement of knowledge in the field of medical science, and (d) Better informing the public concerning the nature, content and purposes of medical education.

A report on this activity was presented at the annual meeting of the Association of American Medical Colleges held in Sun Valley in October, 1947, and was approved unanimously. It is anticipated that a full and final report on procedure can be made very soon.

World Health Organization

Although the United States as a nation has not participated in the activities of the World Health Organization, the work of this group has been endorsed and supported by the American Medical Association and cognizance of it has also been taken by the Association of American Medical Colleges. At the 1947 annual meeting a Committee on World Health Organization was appointed. The chairman of the committee is Dr. Francis Scott Smyth, Dean, University of California Medical School. Dr. Smyth was given full powers to select his own committee. As soon as this committee has prepared a working program, a report will be available for publication.

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"The Worm Turns"

The efforts that are being made to bring the general practitioner back into the picture as an important cog in the machinery of medical practice have met with approval from many sources. One bone of contention has been his exclusion from hospital staffs because of lack of certification. Some medical faculties have laid stress on accepting only certified teachers on their faculties. Whether these actions have raised the value of certification or not is debatable. However, be that as it may, there is a reaction to this. One notable instance is the following resolution adopted recently by the Executive Faculty of the University of Illinois College of Medicine:

1. "That the requirement of a certificate from a specialty board for a position on the hospital staff is an abdication of authority on the part of the staff and places unfair pressure on board members to pass candidates.

2. "That rulings that a physician's salary (as in the Veterans Administration) or advancement (as in many state services) should depend upon a certificate from a specialty board are also inadvisable and put undue pressure on board members to pass candidates,

3. "And that the Dean transmit this resolution to the various organizations, agencies, and others concerned."

Fifty-eighth Annual Meeting

of the

Association of American Medical Colleges

White Sulphur Springs

The Greenbrier West Virginia

November 8-9-10, 1948

College News

New York University
College of Medicine

In commemoration of the late Dr. George B. Wallace, the founder of the Department of Pharmacology, the executive committee of the Alumni Association has inaugurated a campaign to raise $250,000 for the creation of the Wallace Laboratories for Research in Pharmacology. Announcement has been made of a proposed plan to unite the properties and programs of the New York Post-Graduate Medical School and Hospital and the New York University Bellevue Medical Center. Mr. Rush H. Kress, vice president of Samuel H. Kress Foundation, which contributed $1,000,000 to the current campaign of the university, announced his support of postgraduate work for the remainder of this year to the extent of providing $162,000. Dr. Andre Lwoff of the Pasteur Institute, Paris, France, delivered the 45th annual Christian A. Herter Lecture April 7 on "Aspects of Biochemical Evolution." Announcement has been made by Joseph Hirsh, acting director of the Research Council on Problems of Alcohol of a grant in the amount of $20,000 for a study on biochemical and endocrinological factors in alcoholism. This study is to be undertaken in the Department of Medicine under the direction of Dr. James J. Smith. It is the second grant made this spring by the Research Council on Problems of Alcohol to special investigations in the field of alcoholism.

Sir Henry Hallet Dale, past president of the Royal Society of England, and a winner of the Nobel prize in 1936, gave a lecture under a grant from the Samuel H. Kress Foundation made for the purpose of stimulating an international exchange of medical information and the postgraduate training of physicians. The title was, "Chemical Transmission of Nervous Effects."

Dr. Louis M. Rousselot has been appointed professor of clinical surgery succeeding Dr. Raymond P. Sullivan. He is also director of surgery at St. Vincent's Hospital.

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University of Texas
School of Medicine

In association with Baylor University College of Medicine, the school sponsored a series of lectures on sugar metabolism delivered by Dr. Charles H. Best, professor of physiology in the University of Toronto Faculty of Medicine. Dr. Arthur P. Stout, professor of surgical pathology of Columbia University College of Physicians and Surgeons, was a guest lecturer recently. Mr. K. J. Heinicke of the Bausch & Lomb Optical Company, gave a demonstration on phase contact microscopy, ultraviolet microscopy, and infra-red microscopy recently.

The new Rehabilitation Clinic in the John Sealy Hospital was dedicated. It is a part of a new surgical unit for plastic surgery, orthopedic surgery, and neuro-surgery. The Monsanto Chemical Company of St. Louis provided the funds for the establishment of this clinic. Dr. Frank K. Krusen of the Mayo Foundation gave the dedication address.

Members of the staff pooled their professional fees in connection with services for Texas City disaster victims and allocated them in proportion to the services rendered to the different departments of the hospital for support of departmental research and professional activities. A grant of $2,500 was received for the H. H. Weinert Memorial Endowment Fund for the support of cardiovascular research under the direction of Dr. George Herrmann, professor of medicine and director of the cardiovascular research laboratory. The regents of the university have authorized a special surgical unit originally proposed by the late Dr. A. O. Singleton, professor of surgery, to provide needed facilities for plastic and neurosurgery.

Bowman Gray School of Medicine

Dr. Angus Crawford Randolph, former resident psychiatrist at the Veterans Hospital, Perry Point, Maryland, has joined the staff of the department of neuropsychiatry as senior resident in psychiatry at Graylyn, the school's rehabilitation and convalescent center.

The North Carolina division of the American Cancer Society has made a grant of $1,000 to pay for a refresher course in cancer for State physicians. Two grants totaling $31,300 from the National Cancer Institute have been received to aid in cancer teaching under the direction of Dr. Robert P. Morehead, professor of pathology. A grant of $5,950 has been received from the National Advisory Health Council of the United States Public Health Service for study of the formation of phospholipides by the liver in cirrhosis. A grant of $8,100 has been received from the National Advisory Health Council in support of research on factors concerned with resistance built up by the human body to chemotherapy. The Life Insurance Medical Research Fund has made a grant of $8,400 to the department of physiology and pharmacology in support of research of peripheral vascular circulation. Dr. George T. Harrell, Jr., head of the department of internal medicine, has been elected a member of the Executive Medical Board of the Oak Ridge Hospital, Tennessee, to formulate the research policy and clinical program to be undertaken in that hospital.

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University of Illinois
College of Medicine

The American Cancer Society has awarded a grant of $18,935 to the department of pathology to be used for an investigation of nucleic and amino acids in relation to cell growth. Dr. Isidore Gersh, associate professor of pathology, will serve as the principal investigator. The university has received grants totaling $51,130 for cancer research, teaching and control, from the National Cancer Institute of the United States Public Health Service. The college of medicine receives $46,130 of this grant for its participation in this work.

Two French physicians have been awarded fellowships to take a twelve months' postgraduate course in allergy which will be offered next fall by the college of medicine. The physicians are Dr. Jean Dausset and Dr. Claude Lapresle, both of Paris. They will receive stipends from a fund established by an anonymous donor. Eight American physicians also will be selected for the course starting September 27. This course will be the fourth to be offered by the University of Illinois Allergy Unit.

Four physicians and dentists from China, Iran, England, and Canada are included in the list of appointees who have been awarded research fellowships in medicine and dentistry. The university has awarded a total of 10 fellowships, each carrying a stipend of $1,800 for one year of study. The appointees and their fields are: Dr. Joseph M. Kieley, Chicago, physiology; Dr. John Schwab, Philadelphia, physiology; Dr. Husang Javid, Teheran, Iran, surgery; Dr. Paul H. Jordan, Jr., Peoria, surgery; Dr. Isaac M. Berry, Chicago, clinical science; Dr. Gordon Henniger, Baltimore, internal medicine; Dr. H. T. Chang, Tientsin, China, internal medicine; Dr. Robert Hess, Wilmette, internal medicine.

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University of Virginia
School of Medicine

The National Research Council has renewed the grant of $9,500 from the American Cancer Society to Dr. C. L. Gemmill, professor of pathology, for the support of research in effect of drugs on glycolysis.

Dr. Harry S. N. Greene, professor of pathology at the Yale University School of Medicine, was the guest speaker for the annual Phi Beta Pi Cancer Lectureship. Doctor Greene spoke on the subject of "Biological Assessment of Tissue Potentialities" on March 24, 1948.

Dr. Bayard T. Horton of the Mayo Clinic spoke on the subject: "Headache:

Differential Diagnosis and Treatment," in the Amphitheatre on Friday, April 9, 1948, as guest speaker on the Postgraduate Program for House Officers.

The American Physiological Society, at its recent annual meeting, approved the formation of the new *Journal of Applied Physiology*, to start publication in July, 1948. Dr. C. L. Gemmill, professor of pharmacology, has been appointed as a member of the Editorial Board, to be composed of twelve physiologists from North America. He will represent particularly the field of Aviation Physiology.

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University of Wisconsin
Medical School

Dr. O. H. Wangensteen, professor of surgery in the University of Minnesota Medical School, delivered a lecture sponsored by Alpha Omega Alpha Honorary Medical Fraternity on the subject of "Studies on the Etiology of Peptic Ulcer with Special Reference to Surgical Management," last April.

Dr. Marion Hines, professor of anatomy in Emory University, delivered three lectures April 26, 27 and 28 on the A. C. Helmholz lectureship. Her subjects were: "The Cortical Control of Movement;" "Extrapyramidal and Pyramidal Activity;" "The Development of the Infant Macaque."

The annual William Snow Miller lecture was delivered April 26 by Dr. John B. Youmans, Dean of the University of Illinois College of Medicine. Dr. Youmans' topic was "Current Problems in Nutrition of Populations."

Dr. Robert F. Pitts, professor of physiology, Syracuse University College of Medicine, spoke on "Renal Factors in the Regulation of the Acid-Base Balance," April 29.

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University of Minnesota
Medical School

Students preparing to study medicine have the highest scholastic standing in the university. Their average honor point ratio is 1.674 on a scale in which 3.0 is the maximum.

During the summer of 1948 the medical school and its affiliated hospitals will offer instruction in the preclinical and clinical fields of medicine. Registration by the following is invited: (a) Practicing physicians; (b) Students from other medical schools upon recommendation of their respective deans; (c) Students at the University of Minnesota Medical School who may register on a voluntary basis.

Courses which are part of the regular medical curriculum, as well as electives, are offered in the following departments: Anatomy; bacteriology and immunology; medicine; obstetrics and gynecology; ophthalmology and otolaryngology; pathology; pediatrics, pharmacology; physiological chemistry; physiology; psychiatry and neurology; radiology; school of public health; surgery. Address: Dean of Summer Session, 880 Administration Building, University of Minnesota, Minneapolis 14, Minnesota.

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Louisiana State University
School of Medicine

Drs. C. Merrill Whorton and Frank C. Womack have been appointed assistant professors of pathology. Doctor Whorton comes from the Mallory Institute in Boston. Doctor Womack was a member of the Vanderbilt University faculty. A grant of $15,364 has been received from the War Department for continuation of studies on bacitracin. A continuation course in diseases of children, sponsored by the school and the State Health Department was held in April for 30 selected general practitioners from rural communities in the State. Visiting lecturers were Drs. Harold E. Harrison and Horace L. Hodes, associate professors of pediatrics, Johns Hopkins Medical School. The National Cancer Institute and United States Public Health Service have made a grant of $19,941 for a department of teaching and research in cancer. Dr. Walter J. Burdette, assistant professor of surgery, is the coordinator of this program.

State University of Iowa
College of Medicine

The Committee on Postgraduate Studies has outlined its future activities. Iowa doctors may take advantage of any or all of these: 1. Monthly clinical conferences at the University hospitals covering many branches of medicine. 2. Short courses at the University hospitals for specialists in certain fields. 3. Consultation clinics, for which several University hospitals staff members may go to any local hospital in the state for a one-day clinical conference. 4. An informal instruction plan, under which any physician can come to the University hospitals and take part in any department's activities for anywhere from one day to a few weeks. 5. Special meetings of local medical societies, the programs for which are developed by the staff at the University hospitals. 6. Assistance in training residents at various veterans' and state hospitals throughout Iowa. More than 800 physicians have come to the University hospitals for these various programs since 1945.

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Northwestern University
Medical School

An increase in tuition rates averaging twenty per cent will become effective September 1. The rate for medicine has been increased to $600. The new revenue will be used chiefly to increase faculty and staff salaries and to provide additional scholarships for needy students.

The medical school has announced that it will employ television during the annual meeting of the American Medical Association to be held in Chicago June 21 through 25. Five days of programs showing both surgical procedures and clinical demonstrations are being arranged. This will be the first instance that television will play a major role in medical education.

A $1,000,000 campaign for the development of an Institute of Human Nutrition for the study of nutritional diseases is announced by the Spies Committee for Clinical Research.

Stanford University
School of Medicine

The sixty-sixth course of popular medical lectures was given April 2, 9, 16 and 30. Participants were Dr. William W. Greulich, Ph.D., "Some Effects of the Atomic Bomb on the Children of Hiroshima and Nagasaki;" Dr. Ronald A. Davison, Dr. Donald E. King, Dr. William H. Northway, "Rheumatism: The Great Crippler;" Dr. William M. Kirby, "Can Streptomycin Cure Tuberculosis?"; Dr. Edwin H. Lennette, "Filtrable Viruses: The Invisible Killers." The Stanford Eye Bank celebrated its first birthday by marking up a year's record of 33 corneas provided for eye graft operations. Most of these corneas came from dead people who willed their eyes to the community service organization; ten came from five people who had to lose an eye because of injury or disease. All qualified eye surgeons on the Pacific coast are privileged to make use of the facilities of the eye bank.

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Long Island College of Medicine

The college is appealing for financial support by the medical profession of Brooklyn. Special exercises will be held to inaugurate the campaign. Physicians who are not alumni of the medical school will be asked to subscribe $200,000 toward a total of $7,000,000 needed by 1950 to finance the erection of a new laboratory building and medical library, and to expand teaching and research programs. Alumni have already oversubscribed a $350,000 goal.

After five years of service as chairman of the Board of Trustees, Dr. Frank L. Babbott, former president of the college, has resigned. His successor is Mr. Lauson H. Stone, an attorney. Dr. Babbott remains as a member of the Board.

The twelfth Adam M. Miller Memorial Lecture was delivered by René J. Dubois, Ph.D., of the Rockefeller Institute for Medical Research on "The Tubercle Bacillus and Tuberculosis," on May 4.

Columbia University College of Physicians and Surgeons

Dr. Cushman D. Haagensen, associate professor of surgery, has been appointed coordinator of cancer teaching. A research program will be developed in close cooperation with the major divisions of the university's medical sciences and clinical departments. The project is financed by a grant of $23,976 from the United States Public Health Service.

Dr. Harold W. Brown has been appointed acting director of Columbia's School of Public Health. He will serve during the absence of Dr. Henry S. Mustard, temporarily on leave to serve as Commissioner of Public Health, New York City.

New appointments: Assistant clinical professor of pediatrics, Dr. Thomas Campbell Goodwin; assistant clinical professor of pathology, Dr. Clifton van Zandt Hawn; Dr. Otto D. Sahler, assistant professor of radiology.

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University of Pennsylvania School of Medicine

Dr. Isaac Starr, dean and professor of therapeutic research, who succeeded the late Dr. William Pepper in the deanship in 1945, has resigned as dean but retains his professorship. He will be succeeded as dean by Dr. John McK. Mitchell, associate in pediatrics. Dr. Mitchell is a graduate of Yale in 1924.

Dr. Robin C. Buerki, dean of the Graduate School of Medicine and director of University Hospitals, has been elected vice-president of the university in charge of medical affairs, succeeding Dr. A. Newton Richards who will retire after 38 years of service in the university. Dr. William S. Parker, assistant dean of the Graduate School, will succeed Dr. Buerki as dean.

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Southwestern Medical School

The Life Insurance Medical Research Fund has awarded Southwestern $5,565 to be used by Dr. Arthur Grollman in the study of high blood preasure.

Two weeks of advanced study of diseases of the chest were held in April under the auspices of the American Trudeau Society in cooperation with the college. The course was designed primarily for physicians in certain southern states. Instruction was provided by the college faculty and a group of visiting physicians and surgeons.

Dr. M. E. Sadler, president of Texas Christian University, will be the speaker at the sixth annual commencement exercises June 7. Dr. Merton M. Minter of San Antonio will deliver the Ho Din oration made annually in connection with the Ho Din Award to one of the college's outstanding students.

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University of Buffalo School of Medicine

The establishment of a division of toxicology is announced. The unit will be supported jointly by the university and the county, and will work closely with city and county authorities, with hospitals and with industry. The director of the division will be Dr. Niels C. Klendshoj, associate in pathology in the medical school, working under Dr. Kornel Terplan, head of the department of pathology. Milton Feldstein, graduate of the College of the City of New York, who has had considerable experience in this field at Bellevue Hospital, New York, and in the Army Sanitary Corps, will do the actual work of performing the experiments.

The Buffalo General and Meyer Memorial Hospitals already have working arrangements with the laboratory and efforts are under way to enlist the cooperation of other hospitals.

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Cornell University Medical College

A grant of $30,000 has been received from the Research Council on Problems of Alcohol to continue research into the causes and treatment of alcoholism. This is an installment of the five year $150,000 project under the direction of Dr. Oskar Diethelm, professor of psychiatry.

Dr. Frank P. Light has been appointed professor and head of the department of obstetrics and gynecology, succeeding Dr. Alfred C. Beck, resigned.

◆ ◆

Harvard University
Medical School

An increase in tuition for all Harvard students is announced. The tuition in the medical school will be raised from $580 a year to $800 a year, beginning in the Fall term of 1948. Loan funds and scholarships are at hand to assist individuals in meeting the increased cost. Additional scholarship funds will be available next Fall. Dean Burwell announced that for the fiscal year 1946-1947 the cost of the medical training program was $732,000 more than in 1940-1941, These sums do not include the department of research projects financed by special gifts.

Dr. Francis D. Moore, assistant professor of surgery, has been named Moseley Professor of Surgery and surgeon in chief at the Peter Bent Brigham Hospital. Dr. Moore graduated from Harvard in 1939.

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Boston University
School of Medicine

Dr. Arthur M. Lassek, head professor of the department of anatomy in the Medical College of the State of South Carolina, has been appointed Waterhouse Professor of Anatomy, effective July 1. He will succeed Dr. Jesse Conel, who has been a member of the faculty since 1923.

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Duke University
School of Medicine

A month's course in Medical Mycology under the direction of Dr. Norman F. Conant will be offered June 28 to July 30 every day in the week except Sunday. The course is designed to insure a working knowledge of the human pathogenic fungi. The number of applicants for the course will be limited. They will be selected on the basis of previous training and their need for this type of work. The fee is $50. On completion of the course a suitable certificate will be awarded. Inquiries should be directed to Doctor Conant.

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George Washington University
School of Medicine

Dr. Walter A. Bloedorn, dean and medical director of the University Hospital, received the honorary degree of Doctor of Science on March 23.

The university has taken possession of its new 405 bed hospital, which cost nearly $5,000,000. Construction was approved as a War Public Works project by the Federal Works Agency which made available $4,063,000 in Lanham Act Funds. The hospital is being equipped by friends of the university who contributed nearly $1,000,000 through a campaign carried on for this purpose.

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Medical College of Alabama

The first annual lecture sponsored by Nu Sigma Nu honoring Dean Stuart Graves was held recently. The guest speaker was Dr. E. T. Bell, professor of pathology in the University of Minnesota. Doctor Graves, who was dean from 1928 to 1945, is now director of admissions to the college of medicine. He has been secretary of Nu Sigma Nu for more than 40 years.

The annual postgraduate seminar will be held May 3 and 4. It is designed chiefly for general practitioners in the southeastern area. Many prominent guest speakers will take part.

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University of Colorado
School of Medicine

The Anna Fuller Fund of New Haven, Connecticut, has renewed the $1,000 research grant to Dr. Berta Scharrer of the department of anatomy to continue her research on experimental tumors in animals.

Yale University
School of Medicine

Thomas R. Forbes, assistant professor of anatomy, becomes the assistant dean of the school in charge of student affairs. He succeeds Donald H. Barron, professor of physiology.

Promoted to Associate Professor: John R. Brobeck, physiology; Clement C. Clay, hospital administration; Frederick C. Redlich, executive officer of the department of psychiatry and mental hygiene.

Assistant Professors: Helen R. Gilmore, psychiatry and pediatrics, in charge of the psychiatric inpatient clinic; William W. Engstrom, medicine; Henry D. Hoberman, medicine; Arnold H. Janzen, radiology; Dorothy M. Horstmann, preventive medicine. Leonell C. Strong, research associate in anatomy, was promoted to the rank of professor.

Clinical Appointments: Aloys G. Ansprenger, assistant clinical professor of radiology; James M. Cunningham, lecturer in psychiatry and mental hygiene, promoted to associate clinical professor; Gideon K. De Forest, assistant clinical professor of medicine; Russell V. Fuldner, lecturer in anatomy and assistant clinical professor of orthopedic surgery; Mildred H. January, assistant clinical professor of pediatrics and psychiatry and mental hygiene; Bernard L. Kartin, assistant clinical professor of medicine.

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University of Utah
School of Medicine

The Utah Medical Foundation recently presented Dr. Edith L. Potter, pathologist in the department of obstetrics and gynecology at the University of Chicago, in the second annual Obstetrics and Gynecology Lectureship. The two lectures given by Doctor Potter were titled: "Immunization to the Rh Factor," and "The Etiology of Maldevelopment of the Human Foetus." The seventh of a series of Intermountain Pediatric Lectures was given by Dr. Charles A. Janeway, professor of pediatrics, Harvard Medical School, on "Clinical Use of the Products of Human Plasma Fractionation," and "Studies on Hypersensitivity." Dr. George E. Birch, professor and head of the department of medicine at Tulane University Medical School, spoke on "Sodium Metabolism in Heart Failure," under the auspices of the Salt Lake County Medical Society and the Department of Internal Medicine. Dr. Hans Selye, professor of experimental medicine and surgery, University of Montreal, delivered a public lecture titled "The General Adaptation Syndrome and the Diseases of Adaptation." The National Cancer Institute granted the sum of $416,404 to the medical school for the construction of a cancer research institute. A Cancer Symposium covering recent advances in cancer etiology, diagnosis and therapy is to be given May 28 and 29. Principal speakers include Dr. Austin V. Deibert, Chief, Cancer Control Division, Washington, D. C., Dr. Frank B. Queen, Pathologist, University of Oregon, Dr. David A. Wood, Stanford University, and Dr. Andrew L. Dowdy, Radiologist, University of California at Los Angeles. Dr. Hyrum Langston will speak May 10 under the sponsorship of the Utah Tuberculosis Society and the Utah Medical Foundation on "Changing Concepts in Surgical Management of Pulmonary Tuberculosis," and "Clinical Use of Angiocardiography." Dr. Charles A. Dean, School of Medicine, Ohio State University School of Medicine, spoke on "Hypersplenism." Dr. Waltman Walters of the department of surgery, Mayo Clinic, addressed the faculty recently on the subject—"The Liver and Biliary Tract in Relation to Surgical Lesions."

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The Woman's Medical
College of Pennsylvania

Founders' Day ceremonies were held March 11. The exercises consisted, in the main, of the presentation of a bust of Dr. S. Josephine Baker, founder of the first Bureau of Child Hygiene in the world in New York City in 1908. Doctor Baker was also a former president of the American Medical Women's

Association, and a consultant of the Children's Bureau of the United States Department of Labor.

A grant of $24,958 has been received from the U. S. Public Health Service, National Cancer Institute, in support of a cancer teaching project for the first year under the direction of Dr. Isabella H. Perry. Doctor Perry will direct the program during a year's leave of absence from the University of California Medical School, where she is assistant professor of pathology. A grant of $1,000 has been made to Dr. Lloyd D. Seager, professor of pharmacology and toxicology, from the Abbott Laboratories for the continuation of the study of synergisms of chemotherapeutic agents in sleeping sickness. The college is the recipient of a gift of micro camera equipment given by Alpha Penn Link No. 23 (Order of the Golden Chain) for cancer research work. On March 24th, 30 members of Alpha Penn Link were guests of the college on the occasion of the formal presentation of their equipment and the unveiling of a plaque. A testimonial dinner to honor Dr. Catharine Macfarlane was given April 7th. The date marked Doctor Macfarlane's having attained fifty years in medicine, and her seventy-first birthday. President Louise Pearce gave the welcome and Dean Marion Fay introduced the guests.

University of Washington
School of Medicine

The university has instituted a course in the application of basic sciences to disease. The course is arranged to bring together the physiologist, anatomist, biochemist, pharmacologist, pathologist and microbiologist with the clinicians.

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Western Reserve University
School of Medicine

Western Reserve has set up a department of microbiology in the School of Medicine. Dr. Lester O. Krampitz has been promoted from associate professor of biochemistry to head the new department as professor of microbiology.

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Georgetown University
School of Medicine

Appointments: Dr. Paul Kiernan, associate professor of surgery, Dr. Daniel Blain, professor and director of the department of psychiatry.

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Loyola University
School of Medicine

Dr. Arthur G. Mulder, of the University of Tennessee College of Medicine, has been appointed associate professor of physiology.

General News

The Passano Award

For the first time since the Passano Foundation was established in 1944, a dual selection has been made. The award goes to the famous Taussig-Blalock team who developed the successful operative procedure which is popularly known as the "blue baby operation." It also marks the first time that a woman has been named as an award winner. The Williams & Wilkins Company, Medical Publishers of Baltimore, established the Passano Foundation to aid in any way possible the advancement of medical research, especially research which bears promise of clinical application. Previous winners have been Dr. E. J. Cohn, of Harvard, for his work on fractionation of blood; Dr. Ernest Goodpasture, of Vanderbilt, for virus culture by the chick embryo method; Dr. Selman Waksman, of Rutgers, for discovery of streptomycin.

Presentation of the $5,000 cash award will be made at the Palmer House, Chiweek of the American Medical Associacago, June 23, during the convention tion.

Dr. Helen B. Taussig is associate professor of pediatrics and Dr. Alfred Blalock is professor of surgery at the Johns Hopkins University Medical School. Since the first "blue baby" operation was undertaken in November, 1944, more than 600 patients drawn from all parts of the world have been operated on at Johns Hopkins Hospital alone.

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Life Insurance Medical Research Fund

United States and Canadian life insurance companies will give more than one-half million dollars for research in heart disease during 1948. The awards raise to $1,800,000 the total research subsidy provided through the fund since it was organized in December, 1945. Thirty-one hospitals, medical colleges and special research clinics in eighteen states and Canada will share $484,790 in the grants and fourteen individual doctors will receive $52,600 in post-graduate fellowships. All research is confined to diseases of the heart, arteries and other blood vessels which account every year for more than 45 per cent of all deaths at all ages in the United States and more than one-half the deaths at ages over forty-five.

The Fund is supported by 149 life insurance companies and is administered through a board of directors representing the life insurance business and an advisory council of medical research experts, the latter headed by Dr. Francis G. Blake, Sterling Professor of Medicine at Yale. Scientific director of the Fund is Dr. Francis R. Dieuaide, clinical professor of medicine on the staff of the College of Physicians and Surgeons of Columbia University.

Among the fourteen fellows of the Fund appointed today are Dr. Mogens Faber of Copenhagen, Denmark, who will work at Columbia University in New York under the supervision of Dr. Erwin Chargaff and John L. Webb, Ph.D., of Pasadena, California, who will work at Oxford University in England under the supervision of Professor J. H. Burn. The international exchange is the first sponsored by the Fund.

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New Professional Training Opportunities Offered Army Doctors

A revised and greatly expanded professional training program for regular Army and Reserve Medical Officers has beeen announced by Major General Raymond W. Bliss, Surgeon General of the Army. The program calls for 1,900 new doctors in the Regular Army and an increasing number of volunteer Reserve officers on active duty. The program is designed to give many more Army doctors the training needed to meet the requirements for certification by the American Specialty Boards, and

to further integrate civilian and military medicine. It will facilitate the classification and career management system already in practice in the Medical Corps whereby every effort is made to assign professional officers to posts where they can practice in their special fields of interest.

The program is designed to attract to a regular Army career medical talent of the highest caliber. One year of active duty as distinguished from training duty is expected for each year of training, whether the training is received in Army or civilian institutions. Resignations will not be considered until this obligation has been fulfilled.

Information concerning any part of the program may be obtained from the Surgeon General's Office. Address requests to the attention of the Chief of Personnel, SGO, Department of the Army, Washington, D. C.

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American Hospital Association

Charles T. Dolezal, M.D., superintendent of City Hospital, Cleveland, has been appointed assistant director and secretary of the Council on Professional Practice, filling the position left vacant with the resignation of Hugo V. Hullerman, M.D.

In his position as secretary of the Council on Professional Practice, Doctor Dolezal will work toward standardization and improvement of procedures of various professional staffs in hospitals, as well as meet with representatives of national organizations of these professions and with hospital officials in the interests of improved efficiency and better care of patients.

Dallas G. Sutton, M.D., Rear Admiral (MC) USN (Ret.), director of study, Government Hospital Relations at the Washington Service Bureau, has been appointed secretary of the Council on International Relations. Mr. C. J. Foley, secretary of the Council on Public Relations, will, in addition, become secretary of the Council on Association Relations following the resignation of Mr. William G. Simmons. Miss Helen V. Pruitt, librarian of the Bacon Library, has been appointed also secretary of the Council on Education of the American Hospital Association. Concerned with promotion, establishment and conduct of educational opportunities for those engaged in hospital activities, this council's work consists largely of planning and conducting institutes of the Association.

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Industrial Medicine in Medical Colleges

Captain Ernest W. Brown, MC., U.S.N., retired, is conducting for the Council on Industrial Health of the American Medical Association, Chicago, a survey of the present status of undergraduate education in industrial medicine in the medical colleges, and also in the schools of public health of the United States and Canada. This entails personal consultations with the deans and other faculty officials who direct this field of study. The chief object of the survey is to promote improved criteria and more adequate recognition of this comparatively new subject in the curriculum. Captain Brown is the executive officer of the Committee on Scientific Development and Education of the Industrial Health Council of the Association.

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National Conference on Professional Education

Nearly 100 leading American educators in the fields of medicine, divinity, law, business and engineering assembled for a three day conference at Buck Hills Falls, Pennsylvania, last month for a national conference on professional education to decide what type of courses should be taught and how they should be taught in a program designed to give our future professional men and women the best possible start in learning their professions from experience and in becoming good citizens. The meeting was under the chairmanship of Elliott Dunlap Smith, Provost at the Carnegie Institute of Technology. Dr. George Packer Berry, University of Rochester, and Dr. Aura Severinghaus, Columbia University, represented medical education. A report on this meeting will be forthcoming later.

Book News

Psychiatry for the Pediatrician

By Hale F. Shirley, M.D., Associate Professor of Pediatrics and Psychiatry, Stanford University School of Medicine. The Commonwealth Fund, New York. 1948. Price, $4.50.

Using his observation of 1,000 children brought to the Stanford University Pediatric-Psychiatric Unit as a guide, the author illustrates his discussion of physical, mental and emotional disturbances with case histories, thus presenting the relationship between physician and parent and physician and child in dynamic form and stressing the individual nature of each case. The book is unique and should prove very helpful to the pediatrician.

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Source Book of Orthopaedics

By Edgar M. Bick, M.D., Associate Orthopedic Surgeon, Mount Sinai Hospital, New York. Ed. 2. The Williams & Wilkins Company, Baltimore. 1948. Price, $8.

Historical and factual. The list of references is staggering. There must be several thousand of them. Yet the author's text material is informative and instructive—for the orthopedist.

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Laboratory Technique in Biology and Medicine

By E. Cowdry, Professor of Anatomy, Washington University School of Medicine. Ed. 2. The Williams & Wilkins Company, Baltimore. 1948. Price, $4.

Formerly titled "Microscopic Technique," the text has been expanded to include related physical methods and microchemical and other laboratory techniques. The text has been brought up to date.

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Headache and Other Head Pains

By Harold G. Wolff, M.D., Professor of Medicine (Neurology) and Associate Professor of Psychiatry, Cornell University Medical College. Oxford University Press, New York. 1948. Price, $12.

This is a report on a carefully conducted series of observations extending over a period of fifteen years of headache. Formerly regarded more or less as a symptom, the author gives it a place as a definite disease entity. "Pains in the head" come into their own in this work. Most interesting and a valuable addition to our knowledge of disease entities.

Pathological Histology

By Robertson F. Ogilvie, M.D., Lecturer in Pathology and Assistant in Forensic Medicine, University of Edinburgh. Foreword by A. Murray Drennan, M.D., Professor of Pathology, University of Edinburgh. Ed. 3. The Williams & Wilkins Company, Baltimore. 1948. Price, $10.

Rewritten and amplified. Highly commendable. Well illustrated.

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Foundations of Neuropsychiatry

By Stanley Cobb, M.D., Bullard Professor of Neuropathology, Harvard Medical School. Ed. 4. The Williams & Wilkins Company, Baltimore. 1948. Price, $2.50.

Gives the student an introduction to the facts and correlations necessary to the understanding of the simpler workings of the central nervous system. Concurrent anatomy, physiology and pathology leading to the descriptions of disease entities are presented concisely and authoritatively. Also brought up to date.

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Physiology of Exercise

By Laurence E. Morehouse, Ph.D., Associate Professor of Physical Education, University of Southern California, and Augustus T. Miller, Jr., Ph.D., Associate Professor of Physiology, University of North Carolina Medical School. The C. V. Mosby Company, St. Louis. 1948. Price, $4.75.

The experiments by human beings described in this book should prove interesting and enlightening. They cover research in the physiology of exercise carried on in the Fatigue Laboratory.

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Encyclopedia of Medical Sources

By Emerson C. Kelly, M.D., Associate Professor of Surgery, Albany Medical College. The Williams & Wilkins Company, Baltimore. 1948. Price, $7.50.

Listing with title and complete reference the outstanding contributions to medical knowledge, together with medical eponyms such as culture media, methods, operations, signs, tests, etc. The list includes more than 5,000 names and 15,000 references. The index lists disorders, operations, and so on, thus providing a completely cross-referenced volume of medical sources. Something entirely new and certainly helpful.

Understandable Psychiatry

By Leland E. Hinsie, M.D., Professor of Psychiatry, Columbia University College of Physicians and Surgeons. The Macmillan Company, New York. 1948. Price, $10.

A sort of heart to heart talk between the physician and the patient intended to lead to a perfect understanding between the two to the end that treatment will be facilitated and the result better than would ordinarily be the case.

◆ ◆

Problems of Hospital Administration

Presented by Charles E. Prall, Director Joint Commission on Education of the College of Hospital Administrators. Physicians' Record Company, Chicago.

This is a report of a study based on interviews with 100 hospital administrators located in various sections of the United States. It is a most interesting document, one which can easily serve as a textbook for those who intend to enter this field of work. The members of the commission and the 100 persons interviewed represent the elite of hospital administrators.

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Practical Methods of Biochemistry

By Frederick C. Koch, Frank P. Hixon Distinguished Service Professor Emeritus of Biochemistry, University of Chicago, and Martin E. Hanks, Associate Professor of Biochemistry, University of Chicago. Ed. 5. The Williams & Wilkins Company, Baltimore. 1948. Price, $3.

The main changes in this edition are expansion of the material on manometric methods, the addition of microbiological methods for vitamins and amino acids and the introduction of new or revised colorimetric and fluorometric methods.

◆ ◆

Clinical Diagnosis by Laboratory Methods

By James C. Todd, M.D., Late Professor of Clinical Pathology, University of Colorado School of Medicine, and Arthur H. Sanford, M.D., Professor of Clinical Pathology, Mayo Foundation, University of Minnesota, with the collaboration of George G. Stilwell, M.D., Division of Clinical Laboratories, The Mayo Clinic. Ed. 11. W. B. Saunders Company, Philadelphia. 1948. Price, $7.50.

No comment need to be made about a book which has continued to meet with approval for nearly forty years. The text has been revised carefully, much that is old deleted and much that is new has been added. It is still "tops" in the field of clinical pathology. The book is still a top favorite.

The Acute Bacterial Diseases: Their Diagnosis and Treatment

By Harry F. Dowling, M.D., Clinical Professor of Medicine, George Washington University School of Medicine, with the collaboration of Lewis K. Sweet, M.D., Chief Medical Officer in Pediatrics and Infectious Diseases, Gallinger Municipal Hospital, and Harold L. Hirsch, M.D., Assistant Professor of Medicine, Georgetown University. W. B. Saunders Company, Philadelphia. 1948. Price, $6.50.

Combining the new order of diagnosis and treatment with what is worth while in the old order, serving as a practical guide. Divided into 4 parts: Part I—Diagnosis and Treatment of acute bacterial diseases. Part II—Diseases caused by cocci. Part III—Diseases caused by bacilli. Part IV—Bacterial diseases in which exotoxins are a major factor. Too many chapter references.

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Textbook of Gynecology

By Emil Novak, M.D., Assistant Professor of Gynecology, the Johns Hopkins Medical School. Ed. 3. The Williams & Wilkins Company, Baltimore. 1948. Price, $8.

Revised and brought up to date. A very complete student textbook.

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Psychobiology and Psychiatry

By Wendell Muncie, M.D., Associate Professor of Psychiatry, Johns Hopkins University School of Medicine. Ed. 2. The C. V. Mosby Company, St. Louis. 1948. Price, $9.

Organized into three parts, this book covers the concept of psychobiology and the fundamentals of human behavior; the pathology of human behavior, including a discussion of the Meyerian terminology; and the treatment of abnormal behavior reactions. Thus, in one comprehensive volume is given the essential tools with which to work out of the many and varied problems of the mentally disturbed and disorganized patients.

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Human Physiology

By F. R. Winton, M.D., Professor of Pharmacology, and L. E. Bayliss, Ph.D., Reader in Physiology, University College, London. Ed. 3. The Blakiston Company, Philadelphia. 1948. Price, $7.

Primarily for the medical student; aimed at encouraging "the intellectual attitude of an alert explorer" rather than allowing him to remain the "passive recipient of orthodox knowledge." Students will like this book.

Bergey's Manual of Determinative Bacteriology

By Robert S. Breed, Cornell University; E. G. D. Murray, McGill University, and A. Parker Hitchens, University of Pennsylvania, assisted by sixty contributors. Ed. 6. The Williams & Wilkins Company, Baltimore. 1948. Price, $15.

Reset in double column format. Text completely revised; nearly 300 new species are described. A new feature is the source and habit index. The Genus and Species Index is brought up to date and includes synonyms and incompletely described species. The last word in bacteriologic knowledge; unfortunately, too much for the medical student, but an excellent reference work nevertheless.

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Glomerular Nephritis: Identification of Tumors

By N. Chandler Foot, M.D., Professor of Surgical Pathology, Cornell University Medical College. J. B. Lippincott Company, Philadelphia. 1948. Price, $6.

Presenting the essential gross and microscopic pathologic features, systematically arranged for easy identification. A quick reference ideally suited for use by the student. The tabulations of tumors by tissues and organs is an excellent idea.

Treatment in General Practice

By Harry Beckman, M.D., Professor of Pharmacology, Marquette University School of Medicine. Ed. 6. W. B. Saunders Company, Philadelphia. 1948. Price, $11.50.

A book which has survived for eighteen years and appeared in six editions must have practical value—for the practitioner. It is rather large and ponderous for the medical student although he can learn much from the book if he has time to read it—and he should have time. This reviewer found the book far more informative and valuable as an adjunct or aid in practice, especially in therapy, than the standard textbook on medicine. Students should be urged to provide themselves with a copy of the book.

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Endogeneous Endocrinotherapy Including the Causal Cure of Cancer Compendium

By Jules Samuels, M.D., Specialist for endogeneous endocrinotherapy, Amsterdam. Holdert & Co., Amsterdam. 1947.

◆ ◆

Surgical Applied Anatomy

By Sir Frederick Treves. Ed. 11. Revised by Lambert Rogers, F.R.C.S., Professor of Surgery, University of Wales. Lea & Febiger, Philadelphia. 1948. Price, $6.

Too well known to require comment.

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